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ABSTRACT

This document presents an annotated listing of the research in science education that was reported during 1997. The listing includes educational research reported through doctoral dissertations and master's theses, journal articles, conference papers, electronic documents, and other items. A listing of institutions where the research was completed is given for dissertations and theses. For journal articles, a list of the journals searched and the number of articles found is included. The 1997 version of this annotated listing represents the first time an attempt has been made to capture a broader range of research listings by incorporating electronic documents available on the World Wide Web and by including articles from journals less familiar to science educators. Each entry in the listing has been assigned major and minor codes representing the topic of the research. An index characterizes the entries by major codes. (WRM)

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Annual Summary of Research in Science Education 97

Edited by

David L. Haury
&
Wendy Sherman McCann

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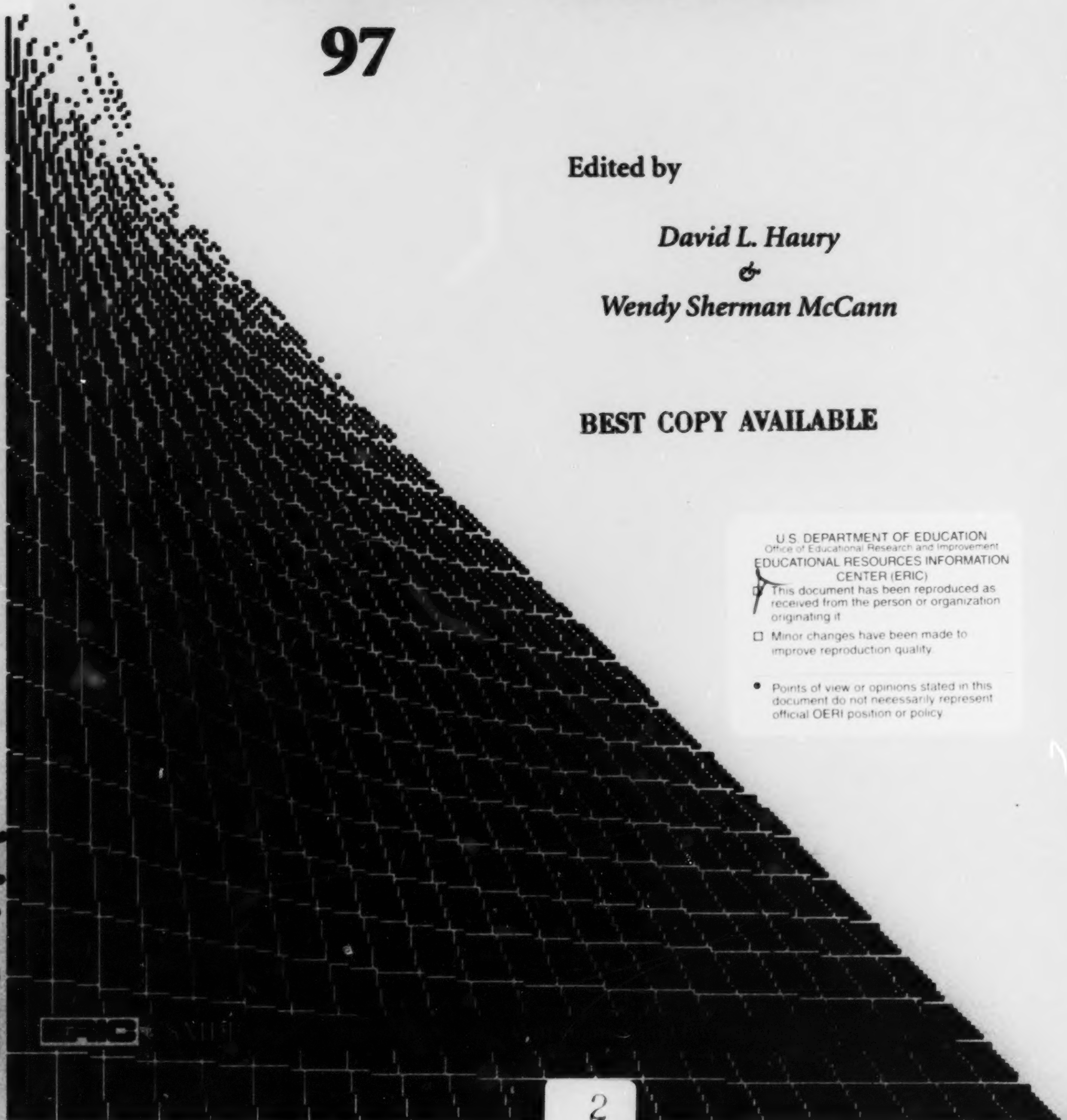

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ANNUAL SUMMARY OF RESEARCH IN SCIENCE EDUCATION
1997

Edited by

David L. Haury & Wendy Sherman McCann

Produced by
ERIC Clearinghouse for Science, Mathematics,
and Environmental Education

1998

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Preface

For many years, the Clearinghouse for Science, Mathematics, and Environmental Education published an annual *Summary of Research in Science Education*, a document that appeared as a special issue of *Science Education*. The *Summary* was intended to facilitate access to research findings and provide a critique of research efforts in science education at one-year intervals. Sort of a "progress report." A variety of factors led to the demise of that *Summary*, but many individuals have continued to express interest in some sort of annual overview of research in science education. For the second year, this publication has been produced in response to those expressions of interest; it presents an annotated listing of research in science education that was reported during 1997. No effort has been made to provide a critical analysis of research reports or areas of research, but we have attempted to identify and accurately describe the science education research reported through doctoral dissertations, journal articles, conference papers, electronic documents, and other items. In the case of dissertations, we have included a listing of the institutions where science education doctoral research was completed, and in the case of journals, we have identified the journals we searched and the number of science education research articles we found.

Though this may not be a comprehensive listing of the science education research reported during 1997, we believe it is the most complete listing available and represents the major trends in science education research. We have attempted to capture a broader range of reports this year by incorporating electronic documents available on the World Wide Web, and by including articles from journals less familiar to science educators. Our hope is that this one-year "snapshot" of research will provide an overview of the field for experienced researchers, doctoral students, and practitioners who use research findings. We will not know if our hope is realized unless those who find this report useful tell us. Though ERIC/CSMEE has the capacity to produce this listing, it is not clear the extent to which a single annotated listing of science education research is valued by the science education community. We earnestly desire feedback, either in writing or by e-mail at the addresses listed below. This listing will also be available through the ERIC/CSMEE World Wide Web site.

Please forward feedback by mail to: Science Education Research Listing, ERIC/CSMEE, 1929 Kenny Road, Columbus, OH 43210-1080; or send e-mail to ericse@osu.edu.

DLH & WSM

Key to Codes

The following topic codes have been used to indicate the major and minor emphases of each dissertation, journal article, paper, or electronic document in this listing. Each entry has been assigned a minimum of one and a maximum of three major codes and maximum of three minor codes. Within the index at the end of the volume, major codes have been used to categorize each publication.

The grade level or educational level of each study is indicated in parentheses after the topic codes. The level codes for teacher education studies may also reflect the grade level(s) at which the interns or teacher participants teach.

Topic Codes

ach	achievement
alf	alternative frameworks
asm	assessment
ats	student attitudes
att	teacher attitudes
bfs	student beliefs
bft	teacher beliefs
bio	biology
bkg	background factors/ context, social factors
car	science-related study/ career choice
cbi	computer-based instruction
ccg	conceptual change
che	chemistry
chs	student characteristics
cht	teacher characteristics
cid	classroom interactions/ discourse interaction
cns	constructivism
cpl	cooperative learning/ group work
cul	cross-cultural studies
cur	curriculum
edt	educational technology
ene	environmental education
eqt	equity issues
esg	earth & space science/ geology
eth	ethnicity
evo	evolution
fsd	field studies/ outdoor education
gen	gender
his	history/ historical implications
hos	hands-on science
inq	inquiry
int	integration, interdisciplinary
kns	student knowledge
knt	teacher knowledge
lab	laboratory
lit	science literacy
lrg	learning/ comprehension
lsy	learning style/ cognitive style
lth	learning theory
mat	materials, equipment
mce	multicultural education/ bilingual education
nas	nature of science
nfd	nonformal & informal education
ntw	networks/ collaboration/ partnerships
pbs	problem solving/ science reasoning
ped	pedagogy
phe	philosophy/ epistemology
phy	physics
ref	reform/ educational change/ standards
rem	representation/ modeling
res	research/ review of research/ conference proceedings
sks	student skills
skt	teacher skills
sts	science, technology, & society
tec	technology
tpd	teacher professional development

Level Codes

AD	adult
EC	early childhood, PreK-4
EL	elementary, K-8
MS	middle school
SE	secondary, 5-12
HS	high school, 9-12
PS	post secondary, 13-
K-12	all school levels
ALL	all student levels
TE	teacher education, teachers
GEN	general interest

Further Elaboration of Selected Codes

In some cases, the codes we have used to group items may not correspond to the more precise terminology often used within the science education discourse community. To aid readers in making a match between the codes we have used and some common areas of research, we offer a further elaboration of codes on the next page. The codes we have used are indicated on the left, and the categories they represent include the topics listed on the right.

Elaboration of Codes

ach	achievement, grades, academic success
ats	student attitudes, mental state, interest, motivation, efficacy
bfs	student beliefs, perceptions, views
bkg	background, context, including social or economic factors, past experience, family interest or background, environment, rural vs. urban
cbi	instruction by computer programs or simulations
chs	student characteristics, including creativity, at-risk behaviors, physical disabilities, learning disabilities, giftedness
cid	classroom interaction, discourse interaction (not necessarily classroom), conversational analysis studies
cul	comparison of cultural factors, not simply a study of another culture
edt	educational technology, design of software, instructional technology other than computers, distance education, multimedia education
eqt	equity issues, power issues
int	integration, interdisciplinary issues, including thematic education
kns	student knowlegde, cognitive structures, mental constructs, system of constructs
lrg	learning, comprehension
lth	learning theory in a more general sense than *lrg*
mat	print or electronic materials, other media, equipment and supplies
mce	multicultural education, including bilingual education
ntw	networks; collaborations between students, teachers, schools; partnerships; mentoring programs
res	research as a topic of study, review of research, including conference proceedings
tec	technology as a topic of study, technology education, engineering

Acronyms Used

The following acronyms appear without definition in abstracts throughout this volume:

AAAS	American Association for the Advancement of Science
CAI	Computer Assisted Instruction
GPA	Grade Point Average
NAEP	National Assessment of Educational Progress
NCTM	National Council of Teachers of Mathematics
NRC	National Research Council
NSF	National Science Foundation
NSTA	National Science Teachers Association
SS&C	Scope, Sequence & Coordination
STEBI	Science Teaching Efficacy Beliefs Instrument
STS	Science, Technology, Society
TIMSS	Third International Mathematics & Science Study

Dissertation Research Reported in 1997

Suzanne Shaw Drummer, *The Ohio State University*
Chris A. Ingersol, *The Ohio State University*
Joyce C. Miller, *The Ohio State University*

This section lists 310 dissertations and master's theses in science education research that were completed in 1997 and abstracted in Dissertation Abstracts International during 1997 through January 1999. Each entry is coded (see Key to Codes) with one to three major codes (in bold type), a maximum of three minor codes, and an indication of educational level (in parentheses). When the level code of "TE" is used to refer to teacher education, a second level code may be added when appropriate to indicate the grade level at which the intern or teacher teaches. All entries are indexed by major codes at the end of the volume (see page 103). An index of dissertations by institution is included at the end of this dissertations section (see page 45).

Abbas, Abdullah Othman. (1997). ***The teacher's role in college level classes for non-science majors: A constructivist approach for teaching prospective science teachers*** (The Florida State University). DAI-A 58(07), p. 2508, 1998. [AAT9802184]

This interpretive study used ethnographic methodology to reveal how an exemplary college chemistry instructor used constructivism as a referent for his teaching and the learning of his students. The instructor switched metaphors as he created conducive learning environments to help facilitate the prospective teachers' enjoyment of their learning journey.

cns, ped, che, tpd (TE, PS)

Abrams, Robert H., Jr. (1997). ***Professional isolation and connection among high school science teachers in upstate New York*** (Cornell University). DAI-A 58(05), p. 1660, 1997. [AAT9728395]

This study reports that in a survey of practicing teachers, "Lack of Time" was the most frequently cited source of professional isolation, and "Friendship" was the most frequently cited source of professional connection. Productive relationships at the state level were higher than expected.

ntw, bft, tpd (TE, HS)

Adams, April Dean. (1997). ***Students' beliefs, attitudes, and conceptual change in a traditional and a constructivistic high school physics classroom*** (University of Houston). DAI-A 58(08), p. 3069, 1998. [AAT9803561]

In this study, the relationships between student beliefs about the nature of science, student attitudes, and conceptual change about the nature of forces were investigated within a traditional and within a constructivistic high school physics classroom.

cns, ats, ccg, bfs, nas, phy (HS)

Adrian, Brian Wayne. (1997). ***Using multimedia to teach college students the concepts of electricity and magnetism*** (The University of Nebraska - Lincoln). DAI-A 58(08), p. 3095, 1998. [AAT9804321]

In an introductory college physics class, multimedia lessons based on the Karplus learning cycle were found to be effective in helping a majority of the students to better understand eight topical categories relating to the concepts of electricity and magnetism.

edt, ped, lth, phy (PS)

Ahern, Kathryn A. (1997). ***Quest for learning: A study of teachers' perceptions of the Satellite Education and Environmental Research program*** (The University of Nebraska - Lincoln). DAI-A 58(12), p. 4604, 1998. [AAT9819687]

This study examines the perceptions of teachers who participated in the Satellite Education and Environmental Research (SEER) Program Water Project, a distance education course developed at the University of Nebraska-Lincoln. The central finding that emerged was the changed focus of teaching science more thematically.

edt, cur, ene, bft (TE)

Al-Momani, Ibrahim Abdalla. (1997). ***A study of teacher inservice in Jordan using an inservice approach developed for teachers in the United States*** (The University of Iowa). DAI-A 58(05), p. 1660, 1997. [AAT9731758]

Jordanian teachers seemed to understand and enthusiastically embrace basic constructivist ideas promoted in the adapted version of the Science PALs inservice. Contrary to custom, students were observed asking more questions, requesting more activities and science time, and engaging in science discussions.

tpd, cns, att (TE)

Alao, Solomon. (1997). ***Predicting fifth-grade students' understanding of ecological science concepts with motivational and cognitive variables*** (University of Maryland College Park). DAI-A 58(09), p. 3412, 1998. [AAT9808575]

Results of this study indicate that prior knowledge, interest, learning goals, and strategy use should be included in a theoretical model's design to explain and to predict fifth grade students' understanding of ecological concepts.

kns, ene, ats, gen (MS)

Aldrich, Lynn Karter. (1997). ***Effects of physical science courses which emphasize content or process on efficacy beliefs of preservice elementary teachers*** (Temple University). DAI-A 58(10), p. 3877, 1998. [AAT9813475]

Using the STEBI-B instrument as a pretest and a posttest, science teaching efficacy beliefs of preservice elementary teachers were compared. Results show an increase in the self-efficacy subscale for those teachers taking the process oriented course concurrently or after having completed a science methods course.

att, tpd, phy (TE, EL)

Allan, Elizabeth Ann. (1997). ***Case studies of curriculum implementation in science classrooms*** (University of California, Riverside). DAI-A 58(08), p. 2979, 1998. [AAT9804255]

The purpose of this research was to detail what has been implemented as the secondary school science curriculum, and what the major influences were on its development. To do so, this study looked at how teachers translated curriculum influenced by specific policy documents into classrooms.

cur, ped (HS)

Allen, D'Maris Anne Lumpkin. (1997). ***The effects of computer-based multimedia lecture presentations on community college microbiology students' achievement, attitudes and retention*** (The University of Texas at Austin). DAI-A 59(02), p. 0448, 1998. [AAT9824854]

This quasi-experimental study (n=76) showed that there was no significant difference between the two groups in the areas of achievement and retention. The computer-based multimedia group did show significantly higher positive attitude scores than the traditional lecture group.

edt, ach, ats, bio, ped (PS)

Almazroa, Hiya Mohammed. (1997). ***Analysis of Saudi Arabian middle and high school science teachers' conceptions of the nature of science*** (University of Southern California). DAI-A 58(11), p. 4169, 1997. [AAT9816006]

The study (n=786) revealed that Saudi science teachers hold numerous misconceptions about the nature of science (NOS) with a significant difference in understanding between the male and female teachers. Teachers with a major in physics held more adequate views than did teachers with other majors. Novice teachers were found to have more adequate conceptions of the NOS than did experienced teachers.

nas, bft, knt (TE, SE)

Anaam, Mahyoub Ali. (1997). ***The academic and nonacademic characteristics of science and nonscience majors in Yemeni high schools*** (Syracuse University). DAI-A 58(12), p. 4604, 1998. [AAT9819121]

Science majors had higher degrees of curiosity in science, higher levels of interest in science during high school, higher tendencies to believe that their majors will help them to find a potential job in the future, higher degrees of achievement in science subjects, and rated their math teachers higher than did nonscience majors.

ats, chs, car, bfs (HS, PS)

Anderson, Catherine Ann. (1997). ***Comparison of teacher-directed and student-directed journals on achievement in college chemistry*** (The University of Texas at Austin). DAI-A 58(07), p. 2589, 1998. [AAT9802816]

This research used written student journals as a means to improve academic achievement in a course designed for nonscience majors. Although there was no benefit in terms of academic achievement or conceptual and algorithmic problem solving success, students using the student-directed format held more positive opinions toward this type of journal.

ped, ats, che, ach (PS)

Armstrong, Kerri Lynn. (1997). ***World views: Their nature and function in the biology classroom*** (University of Minnesota). DAI-A 58(03), p. 0805, 1997. [AAT9724162]

This investigation revealed that 22 community college students did not view themselves as part of science or nature. The investigation also found students' views of the self, nonself, relationships and causality affected their learning and apprehension of key biological concepts.

bio, lth, bfs, lit (PS)

Armstrong-Hall, Judy Gail. (1997). ***An examination of gender bias on the eighth-grade MEAP science test as it relates to the Hunter-Gatherer Theory of Spatial Sex Differences*** (Wayne State University). DAI-A 58(03), p. 0836, 1997. [AAT9725812]

This study reports that the Hunter-Gatherer Theory of Spatial Sex Differences appeared to be able to predict that males could perform better on problems involving mental movement and females could perform better on problems involving the pattern recall of unconnected items.

gen, sks, pbs (MS)

Barrett, Martha Cohen. (1997). ***Science and engineering students' classroom experiences: An analysis by gender and discipline*** (The University of Michigan). DAI-A 58(02), p. 0394, 1997. [AAT9721943]

Based on a concern about the persistence of women in science-related disciplines, this study examines whether science and engineering students' classroom experiences and the importance students attributed to their experiences differed by gender and discipline.

gen, bkg, car, tec, bfs, ats (PS)

Beck, Diana Pyse. (1997). ***Interpretive video analyses of children's inquiry: Fantasy and other emergent contexts at a summer science camp for elementary school children*** (University of Illinois at Urbana-Champaign). DAI-A 58(06), p. 2140, 1997. [AAT9737049]

Several new constructs for investigating children's learning in science are proposed in this study, including a construct or a unit of study for analyzing children's learning called 'spheres of activity.' Also, the way children use tasks or develop tasks out of the projects assigned by teachers was examined.

inq, lth, cns (EL)

Bednarski, Marsha H. (1997). ***Constructivism and the use of performance assessment in science: A comparative study of beliefs among preservice and inservice teachers*** (The University of Connecticut). DAI-A 58(08), p. 2979, 1998. [AAT9806163]

This study identified whether preservice and inservice teachers differed with respect to their beliefs about constructivist-based learning strategies and performance assessment. It also identified whether teacher beliefs held about constructivist-based learning strategies were related to the construction of assessments they developed for use in their classrooms.

cns, asm, ped, bft, tpd (TE)

Beilby, Jerry Paul. (1997). ***The construction of students' knowledge of ecological concepts through the use of structured controversy compared to individual study*** (University of Minnesota). DAI-A 58(02), p. 0417, 1997. [AAT9721611]

Change in the quality of knowledge propositions was compared between the two groups. No significant differences were observed for targeted ecological concepts. The control group showed a significant decrease in the number of correct non-target propositions and an increase in number of incorrect non-target propositions based on pre- to post-treatment data.

cpl, ene, ped, ccg, ats (PS)

Bennett, Bathsheba Yvette. (1997). ***Metaphor and curriculum theorizing in environmental studies*** (Temple University). DAI-A 58(03), p. 0714, 1997. [AAT9724211]

Argues that if metaphor, such as Kliebard's proposed metaphor, is to inform curriculum theory toward program development in environmental studies, then the domain of environmental studies must be constrained to permit development and accurate transmission of visual imagery appropriate to the domain.

ene, cur (TE)

Blaine, Lloyd Frank. (1997). ***Student achievement in an integrated math/science curriculum and a math only curriculum*** (Texas Woman's University). MAI 36(01), p. 0032, 1998. [AAT1386376]

Two groups of fifth graders were tested after one group was exposed to a curriculum of mathematics and science while the other was exposed to a mathematics only curriculum. A t-test showed no significant difference between the two classes, but the scores of the experimental group did show a significant difference between the pre- and posttest.

int, ach, cur (MS)

Blank, Lisa M. (1997). ***Metacognition and the facilitation of conceptual and status change in students' concepts of ecology*** (Indiana University). DAI-A 58(08), p. 3069, 1998. [AAT9805379]

This study explores the relationship between metacognitive teaching strategies, status, and conceptual change during a three month unit on ecology. Students began to understand the value of critically investigating ideas before incorporating them into their knowledge structures.

ped, ccg, kns, lrg (MS)

Blue, Jennifer Marie. (1997). ***Sex differences in physics learning and evaluations in an introductory course*** (University of Minnesota). DAI-A 58(08), p. 3069, 1998. [AAT9804710]

When college students were matched according to their high school background and their physics pretest scores there was no gender differences in their post-test scores. Women liked the relevant aspects of the course more than men did.

gen, lrg, bkg (PS)

Boedecker, Martha Elaine. (1997). ***What influences science teaching? A study of three novice rural science teachers*** (Oklahoma State University). DAI-A 59(02), p. 0448, 1998. [AAT9824408]

This study showed that science courses had a major effect on teachers. If the National Science Education Standards are adopted, science teachers would not have to wait until their science methods courses to be exposed to the practices recommended by the National Research Council.

tpd, ref, ped (TE)

Bowers, Richard M. (1997). ***The impact of introductory science and English courses on the level of logical thinking of community college students*** (Texas A&M University-Commerce). DAI-A 58(08), p. 2974, 1998. [AAT9806307]

The GALT pretest was a significant predictor of logical-thinking skills in each of the entry-level courses of physics, chemistry, biology, or English in six public community colleges representing differing geographical regions of Texas.

pbs, sks, phy, che, bio (PS)

Bradford, Cristine Schoneweg. (1997). ***A case study of change in conceptions and practices of prospective science teachers during field experiences*** (The Pennsylvania State University). DAI-A 58(12), p. 4617, 1998. [AAT9817433]

This was a qualitative study of the experience of two prospective science teachers. Results imply that field experiences must explicitly attempt to facilitate student teacher development towards critical ways of thinking about science-specific pedagogical conceptions and practices.

tpd, fsd, ped, bft (TE, HS)

Brandes, Aaron Andre. (1997). ***Seeds of science practice: Parallels between the science thinking and activities of sixth-grade children and professional scientists*** (Massachusetts Institute of Technology). DAI-A 59(06), p. 1969, 1998. [Not Avaliable from UMI]

Data for this study was collected during six months of research in a sixth-grade classroom. Themes from the history, philosophy and sociology of science were used to identify the similarities and differences of children's and scientists inquiry practices.

inq, lth, nas (MS)

Broadway, Francis Sylvester. (1997). ***Student teachers' sense-making of an instructional ecology*** (University of South Carolina). DAI-A 58(11), p. 4191, 1998. [AAT9815484]

This microethnographic study found that since student teachers do not volunteer explanations for why teachers do what they do without explicit prompting, they need opportunities to engage in discourse which facilitates and encourages the dynamic process of sense-making.

tpd, cid (TE, EL)

Brown, Ellen Jean-Elizabeth. (1997). ***The effects of extended block scheduling on math and science achievement in Missouri and Illinois high schools*** (Saint Louis University). DAI-A 58(08), p. 3075, 1998. [AAT9803755]

The study compared the ACT math and science average scores of a senior class who participated in a traditional schedule, with the scores of a later graduating class, in that same school (n=28), who participated in an extended block schedule. The only significant difference was found in the science scores of girls who participated in block scheduling.

ach, ped, gen, ref (HS)

Brownstein, Erica Marie. (1997). ***Interaction between assessment and instruction in science: A teacher's decision-making process*** (The Ohio State University). DAI-A 58(10), p. 3877, 1998. [AAT9813228]

This research examined a chemistry teacher in an AP class in a Midwestern urban setting interactively assessing his students and determined how knowledge gained during that assessment affected his instructional decision-making.

asm, ped, che, cns, bft (HS)

Bryan, Lynn Ann. (1997). ***A case of learning to teach elementary science: Investigating beliefs, experiences, and tensions*** (Purdue University). DAI-A 58(12), p. 4605, 1998. [AAT9818925]

This study examined how the beliefs and experiences of a preservice elementary teacher within the context of reflective science teacher education influenced the development of her professional knowledge. The findings indicated that reframing is crucial to developing professional knowledge.

tpd, bft, knt (TE, EL)

Bunt, Nancy R. (1997). ***The early evolution of southwestern Pennsylvania's regional math/science Collaborative from the leadership perspective*** (University of Pittsburgh). DAI-A, 59(01), p. 0069, 1998. [AAT9821235]

This study describes the genesis of the Collaborative by drawing upon archival information. The development process is outlined, influences are cited, and recommendations are given for similar projects.

his, ntw, ref (ALL)

Butler, Susan McAleenan. (1997). ***Problem-based learning in a secondary science classroom*** (The Florida State University). DAI-A 58(12), p. 4605, 1998. [AAT9817308]

This study provides details of real-life problems tackled by students and then discusses the learning which occurred by comparing the teacher's intended curriculum with the actual curriculum experienced by the students in this problem-based learning environment.

pbs, lrg, cur, int, asm (SE)

Campbell, Brian David. (1997). ***The development of causality in the young child*** (The University of Iowa). DAI-A 58(05), p. 1645, 1997. [AAT9731771]

Six Piagetian-type tasks were developed to investigate causal explanations through interviews (n=101). Results showed that, as grade level increased for four of the six tasks, performance on those tasks tended to improve. There was no statistically significant difference between gender and performance on the tasks.

lth, pbs, gen, bkg (EL)

Carter, Nicholas Brent. (1997). ***The communication of science to the public: A philosophy of television*** (The Ohio State University). DAI-A 58(05), p. 1488, 1997. [AAT9731598]

The proposed model submits that not only are endeavors to communicate scientific ideas to the disinterested populace of overriding importance but can be quite successful if production styles are altered to reflect more "interest-motivating" designs.

nfd, lit, rem, tec (GEN)

Catallozzi, Michelina. (1997). ***Designing and evaluating an instructional exercise as a supplement to the fluids & electrolytes lecture*** (Universite de Sherbrooke). MAI 36(04), p. 0887, 1998. [AATMQ26555]

An instructional exercise for first year nursing students, in the Jeopardy format, was designed to incorporate understanding, group collaboration, and metacognition. An alternate teaching method was needed to increase student understanding of previously acquired knowledge and its application.

ped, lrg, cpl (PS)

Century, Jeanne Rose. (1997). ***The evaluator as technical assistant: A model for systemic reform support*** (Boston University). DAI-A 57(11), p. 4691, 1997. [AAT9713141]

This study explored evaluation of systemic reform and presents a model that organizes systemic reform support into three functions: evaluation, technical assistance, and a third, named here as "systemic perspective."

ref (EL)

Chien, Cheng-Chih. (1997). ***The effectiveness of interactive computer simulations on college engineering student conceptual understanding and problem-solving ability related to circular motion*** (The Ohio State University). DAI-A 58(07), p. 2589, 1998. [AAT9801666]

Computer simulation, constructivist and Vygotskian perspectives, and circular motion are the three elements of the specific Chain Model for instructional design. The results of problem solving activities showed that students using computer simulations had significantly higher scores than students not using computer simulations.

cbi, ach, cns, phy, tec (PS)

Chin, Christine Hui Li. (1997). ***Students' learning approaches and their understanding of some chemical concepts in eighth grade science*** (University of Illinois at Urbana-Champaign). DAI-A 58(10), p. 3878, 1998. [AAT9812557]

This study investigated the relationship between students' learning approaches and their conceptual understanding of chemical concepts; described the qualitative differences between a deep and surface learning approach; and identified students' cognitive and metacognitive strategies.

lrg, kns, che (MS)

Chinn, Clark Allen. (1997). ***A microgenetic study of learning about the molecular theory of matter and chemical reactions*** (University of Illinois at Urbana-Champaign). DAI-A 58(06), p. 2068, 1997. [AAT9737073]

This study reports the results of an experimental microgenetic study of how children learn complex knowledge from text and experiments. Multiple explicit explanations of three or four chemical reactions appeared to be necessary for middle-school students to master key concepts.

lrg, kns, mat, che, lab, ped (MS)

Cho, Hyung-Sook. (1997). ***Early childhood teachers' attitudes toward science teaching*** (The Pennsylvania State University). DAI-A 58(05), p. 1573, 1997. [AAT9732260]

Elementary teachers' attitudes toward science teaching were found to be related to self-confidence, preservice preparation, school environment, and teachers' beliefs about science.

att, bft, tpd, bkg, nas (TE, EL)

Chung, Mi-Lee Ahn. (1997). ***Individual and small group interactions in learning-to-teach with a hypermedia case*** (Purdue University). DAI-A 58(12), p. 4559, 1998. [AAT9818933]

The results of this study suggest that effective use of hypermedia cases takes place in a community of learners where the learners share the context and can draw upon the resources afforded by the technology, as well as each other.

edt, cpl, tpd, cns, ccg (TE, EL)

Chung, Phan Thanh. (1997). ***Effects of chemical demonstrations in teaching analytical chemistry*** (Simon Fraser University). MAI 36(03), p. 0674, 1998. [AATMQ24223]

The data analysis showed that this experimental teaching program had positive effects on students' attitudes toward learning in the course. The results showed increases in students' interest and assimilation of knowledge when learning analytical chemistry with demonstration experiments.

ats, che, ped, ach (PS)

Clark, Stephen Allan. (1997). ***Student motivation in a high school science laboratory: The impact of computers and other technologies on young adolescent physics students*** (University of Georgia). DAI-A 58(0), p. 2141, 1997. [AAT9735498]

This study found that many computer activities and "high tech" labs were too unstructured, leaving students bewildered, confused and unmotivated. For maximum motivational effects, it was necessary to facilitate students so they could concentrate on the data gathered rather than on the operation of the equipment.

cbi, edt, ats, phy, lab (HS)

Cole, Karen Bruce. (1997). ***Challenges of bilingual education: Can a hands-on approach by an English speaking science teacher help?*** (Texas Woman's University). MAI 36(03), p. 0660, 1998. [AAT1388038]

Results indicated that an English-speaking teacher can be effective with bilingual students when science instruction is presented in a hands-on format. Another finding of the study indicated a more positive student attitude when science instruction was hands-on.

mce, hos, ats (K-12)

Conefrey, Theresa Catherine. (1997). ***Discourse in science communities: Issues of language, authority, and gender in a life sciences laboratory*** (University of Illinois at Urbana-Champaign). DAI-A 58(10), p. 4097, 1998. [AAT9812564]

This study explored the experience of scientific socialization and professionalization for women in a lab setting. It details how gender marks many interactions in the lab, including competition, sex-role stereotypes, and a conversational style that may be more compatible with men's than women's forms of talk.

cid, gen, car, lab, bio (PS)

Crapenhoft-Gatewood, Kelly Lynn. (1997). ***Student experiences in an integrated science course: A phenomenological study*** (The University of Nebraska - Lincoln). DAI-A 58(06), p. 2141, 1997. [AAT9736926]

A phenomenological approach was used in order to develop a holistic picture of student participants' experiences in a newly-implemented integrated science course in which many of the suggestions made by science reform efforts were incorporated at a Midwestern inner-city high school.

int, ref, cur, ped (HS)

Craven, John Anthony, III. (1997). ***Relationships between new science teachers' beliefs and student perceptions of the learning environment*** (The University of Iowa). DAI-A 58(08), p. 3069, 1998. [AAT9805661]

Findings from this study suggest that the more aligned a new teacher's beliefs regarding teaching and learning are to the National Science Education Standards, the more prone the teacher is to establish a learning environment in which students perceive a constructivist classroom.

bft, bfs, cns, ref (TE)

Creager, Noel Andrew. (1997). ***It is a learning journey: The application of a constructivist model to an integrated junior high science class*** (Pacific Lutheran University). MAI 36(01), p. 0032, 1998. [AAT1386329]

Class explorations with the concept of photosynthesis using constructivist methods did not seem to change students' original perceptions. Constructivist methods may need to be introduced through guided practice before they can be applied independently by junior high school students.

cns, int, ped, bfs (MS)

Crismond, David Paul. (1997). ***Investigate-and-redesign tasks as a context for learning and doing***

science and technology: A study of naive, novice and expert high school and adult designers doing product comparisons and redesign tasks (Harvard University). DAI-A 58(08), p. 3070, 1998. [AAT9807232]

High school students and adults with varying degrees of design experience doing two technology investigate-and-redesign (I&R) tasks were studied. Each task involved subjects investigating products, designing experiments to compare them fairly, and then redesigning the devices.

tec, sks, pbs (HS, AD)

Cundiff, Kimberly Dawn. (1997). ***Observations of computer-based recitations in the introductory undergraduate mechanics course*** (University of Louisville). MAI 35(06), p. 1598, 1997. [AAT1385780]

No differences were found in scores on the Force Concept Inventory for university physics students who took a regular versus a computer-based recitation course. Achievement scores did differ by gender and ethnicity.

ach, cbi, phy, gen, eth (PS)

Curtis, Krystal D. Berry. (1997). ***A modified research approach teaching style in a high school chemistry classroom*** (West Virginia University). DAI-A 58(03), p. 0808, 1997. [AAT9727673]

Students benefited from the adoption of a modified research teaching style. Successful implementation was mirrored by student response to the teaching style. It was concluded that the teacher has a great deal of influence over student acceptance of something different and new.

ped, ats, che (HS)

D'Agincourt, Lorraine Gouges. (1997). ***Re-presenting science: A study of elementary teachers' experiences and understandings of science*** (Simon Fraser University). MAI 36(03), p. 0675, 1998. [AATMQ24078]

The science experiences of five student teachers and four practicing elementary school teachers were documented. Also reported were the complexities of constructing scientific knowledge and the influences that led to feelings of alienation from science as well as those that contributed to positive attitudes.

tpd, knt, att, bft (TE, EL)

Dallal, Kamel Salim. (1997). ***The influence of the guided constructivist instructional model on attitudes toward secondary-level physics*** (The University of Southern Mississippi). DAI-A 58(08), p. 3070, 1998. [AAT9806478]

The effect of guided constructivism and expository instructional methods on the attitudes of students toward physics is reported. Significant interactions between the treatment groups and cognitive levels were found on the criterion variable of beliefs about physics as a process of learning and enjoyment of physics.

ped, ats, cns, phy, bfs, gen (HS)

Dass, Pradeep Maxwell. (1997). ***The Collier Chautauqua program: A formative evaluation of the implementation of the Iowa Chautauqua model of professional development and its effectiveness in improving science teaching*** (The University of Iowa). DAI-A 58(08), p. 3070, 1998. [AAT9805663]

A formative evaluation of the implementation of the Iowa Chautauqua model in Collier County, Florida, was conducted during 1995-97, focusing on implementation issues and teacher enhancement. Teacher enhancement was closely related to changed practice, which was critically influenced by implementation issues at broader levels.

tpd, ref, ped, skt (TE)

De Laney, Taylor Austin. (1997). ***An environmental science curriculum intervention: Students' attitudes and perceptions toward science and scientists*** (Saint Louis University). DAI-A 58(01), p. 0070, 1997. [Not Available from UMI]

This investigation reports that college students exposed to an environmental science curriculum appear to have more positive attitudes and less stereotypic imagery of scientists than those who have had exposure to a traditional curriculum. Females responded much more dramatically than males.

gen, ene, ats, cur, nas (PS)

DeChant, Thomas Fredrick. (1997). ***The effects of a regional natural history course on outcome expectancy, self-efficacy, and instructional methods of science teachers*** (North Carolina State University). DAI-A 58(06), p. 2100, 1997. [AAT9737635]

This study assessed the effects of an inservice training course entitled "Natural History of the Southern Appalachians" on regional teachers. It appears that regionally specific Natural History training gives teachers inexpensive options to teach science, as well as making them more comfortable with the delivery of science instruction.

tpd, cur, ene, att (TE)

DeClue, Timothy Hall. (1997). ***Academic computer science (CS) and gender: A naturalistic study investigating the causes of attrition*** (Southern Illinois University at Carbondale). DAI-A 58(07), p. 2511, 1998. [AAT9801057]

Theories related to prior experience and the perception that CS has a culture which is hostile to females were strengthened. The belief that females have greater logistical problems in CS than males, or that females tend to have a different programming style than males which adversely affects the females' ability to succeed was not supported.

gen, tec, bkg, sks, car (PS)

Deng, Zongyi. (1997). ***The nature of key ideas in teaching high school physics: Three topics in optics, color, the speed of light, and light interference*** (Michigan State University). DAI-A 59(01), p. 0124, 1998. [AAT9822432]

The study reports that the key ideas in teaching three physics topics for high school students differ markedly in theory types, source analogues, and representations from those taught to prospective scientists. The differences are determined by differing purposes and ways of selecting key ideas in textbooks.

cur, mat, phy, nas (TE, HS)

DeSpain, Cynthia Dianne Heflin. (1997). ***Science learning enhancement through the use of children's literature and hands-on instruction*** (Texas Woman's University). MAI 35(05), p. 1130, 1997. [AAT1384833]

Although children enjoyed scientific-based literature stories and colorful pictures, study results indicated that the use of literature did not make a difference in the retention of the content taught.

cur, lrg, hos (EL)

Dieck, Patricia Ann. (1997). ***The effect of a newsletter on children's interest in and attitude toward science*** (Arizona State University). MAI 35(04), p. 0939, 1997. [AAT1384031]

Middle school subjects used two issues of an interdisciplinary newsletter providing a connection to Mars missions. Students' attitudes toward science did not significantly decline. Students' interest in science declined with statistical significance, but the decline was not educationally meaningful.

int, ats, mat, esg, sts (MS)

Dinucci, Jane R. (1997). ***Science reform movements and their effects on teachers' knowledge, curriculum development and instruction*** (The Claremont Graduate University). DAI-A 58(08), p. 3070, 1998. [AAT9805054]

Secondary science teachers were surveyed to determine how informed they were about the six prominent science reform movements in the USA. Most of the responding secondary science teachers were not aware of five of the science reform movements. Implementation of reform proposals appeared to be only loosely connected to the teachers' awareness of the reform movements.

ref, knt, cur (TE, SE)

Doby, Janice Kay. (1997). ***Teacher content knowledge in the context of science education reform*** (Florida Atlantic University). DAI-A 58(02), p. 0425, 1997. [AAT9722612]

The purpose of this study was to examine the effects of an experimental elementary science methods course, which employs the use of laser videodisk technology along with instructional practices suggested by cognitive science and instructional design, on preservice teacher gains in Earth and physical science content knowledge and locus of control in science.

tpd, edt, knt, att, ref (TE, EL)

Donald, Cathey Nolan. (1997). ***The impact of the inclusion of students with handicaps and disabilities in the regular education science classroom*** (Auburn University). DAI-A 58(07), p. 2590, 1998. [AAT9802446]

Results from surveys indicated that multiple changes occur in the opportunities presented to regular education students when students with handicaps and disabilities are included in the regular science classroom. These include the omission of lab activities and problems with higher order thinking skills.

chs, eqt, ped, lab, pbs (K-12)

Doster, Elizabeth Christina Tsamas. (1997). ***Values, dissection, and school science: An inquiry into students' construction of meaning*** (University of Georgia). DAI-A 58(03), p. 0805, 1997. [AAT9726941]

Findings indicate students' perception of the dissection experience were contingent on the consistency (or lack thereof) of their personal value systems with the underlying factors found in each of four dimensions of dissection (moral, epistemological, physical aversion, and familiarity).

ats, bfs, lab, kns, bkg, bio (HS)

Draper, Franklin Gno. (1997). ***Recalling academic tasks*** (The University of Arizona). DAI-A 58(04), p. 1196, 1997. [AAT9729451]

This study focused on what students remembered about five middle school science tasks when they were juniors and seniors in high school. Authentically situated tasks were remembered much better than routine school tasks.

lrg, kns, ped (HS)

Drori, Gili S. (1997). ***The national science agenda as a ritual of modern nation-statehood: The consequences of national 'Science for National Development' projects*** (Stanford University). DAI-A 58(07), p. 2872, 1998. [AAT9802024]

This study was a comparative investigation of the ways by which the globalization of modern science affects the characteristics of different nation-states. Science should also be regarded as a general cultural framework, which is highly institutionalized at the global level.

nas, phe (GEN)

Dube, Amos Mqiniseli. (1997). ***The perceptions of standard five pupils regarding technology*** (University of Pretoria). DAI-A 58(11), p. 4197, 1998. [Not Available from UMI]

The study recommends that a program be designed and implemented to sustain and promote the positive perceptions that pupils have of technology throughout their school years.

ats, car, tec (HS)

Dundis, Stephen Paul. (1997). ***Varying the learning functions of graphics within a video-formatted astronomy lecture: Effects on recall, comprehension, and perceived mental effort*** (The University of Iowa). DAI-A 58(12), p. 4622, 1998. [AAT9819932]

The informative graphic treatment had positive effects on learning. Additionally, there was strong evidence that these positive effects extended with equal force to both recall and higher order comprehension.

edt, lrg, ach, esg (PS)

Engelhardt, Paula Vetter. (1997). ***Examining students' understanding of electrical circuits through multiple-choice testing and interviews*** (North Carolina State University). DAI-A 58(06), p. 2141, 1997. [AAT9737638]

Two versions of a diagnostic instrument known as Determining and Interpreting Resistive Electric circuits Concepts Tests (DIRECT) were developed. Results indicated that students do not have a clear understanding of the underlying mechanisms of electric circuit phenomena.

alf, phy, kns (HS, PS)

Enger, Sandra Kay Corey. (1997). ***The relationship between science learning opportunities and ninth-grade science students' performance on a set of open-ended science questions*** (The University of Iowa). DAI-A 58(05), p. 1645, 1997. [AAT9731789]

Middle school science students (n=917) and their science teachers responded to surveys used to characterize science learning opportunities in science classes. Recommendations include science inquiry practice across a range of contexts and more attention to discussing, reading, and writing in the content area.

bkg, ped, inq, bfs, bft (MS)

Escalada, Lawrence Todd. (1997). ***Investigating the applicability of activity-based quantum mechanics in a few high school physics classrooms*** (Kansas State University). DAI-A 58(08), p. 3071, 1998. [AAT9804410]

This study investigated the applicability of a unit that introduces quantum principles within the context of learning about light emitting diodes. Both teachers and students gave these instructional strategies favorable ratings in motivating students to make observations and to learn.

ped, cur, ats, phy, cbi, hos (HS)

Esterle, Rochelle Eda Penn. (1997). ***Teacher collaboration and curriculum construction: Political, cultural, and structural contexts*** (University of California, Los Angeles). DAI-A 58(08), p. 2983, 1998. [AAT9803538]

This longitudinal case study is the story of one high school's efforts to implement curriculum reform and the effect of local circumstances on reform ideologies. Political, economic, and structural measures initiated to facilitate reform ultimately represented inherent conflicts of interest which undermined the reform effort.

ref, cur, bkg, bft, phe (HS)

Everage, Hilda Irene Holman. (1997). ***The effects of staff development on hands-on teaching and assessment of Illinois benchmarks in early elementary school mathematics and science*** (Saint Louis University). DAI-A 58(08), p. 2923, 1998. [AAT9803767]

The study determined if teachers had college courses or staff development that included methods of teaching and assessing early elementary level mathematics and science, and the frequency with which mathematics and science were taught using hands-on methods.

tpd, hos, asm, ref (TE, EL)

Farrell, Elva Sears. (1997). ***A study of adults' perceptions of learning in two science museums*** (University of South Florida). DAI-A 58(11), p. 4155, 1998. [AAT9815433]

Results revealed that a majority of visitors (89%) perceived they learned as a result of their visit to a science museum. Visitors most often reported learning science information, and learning from interacting with exhibits and reading exhibit signs.

nfd, lrg (AD)

Ferreira, Maria M. (1997). ***Gender issues in graduate science success*** (Indiana Univrsity). DAI-A 58(09), p. 3463, 1998. [AAT9810781]

Quantitative and qualitative study results showed that although males and females began graduate science programs with comparable confidence and backgrounds, females experienced a significantly greater decrease in confidence and had a significantly higher attrition rate.

gen, car, chs (PS)

Fife, Barbara Mae. (1997). ***Students' concept patterns revealed by computer analysis of language-constrained science concept maps*** (The University of Michigan). DAI-A 58(10), p. 3878, 1998. [AAT9811010]

The number of concepts used and concepts connected increased from sixth through twelfth grade. The complexity and richness of composite maps generally increased with grade level; however, grade-level composites showed only weak differences and progression in understanding.

kns, edt (SE)

Filippelli, Laura Ann. (1997). ***The mentoring of male and female scientists during their doctoral studies*** (University of Illinois at Chicago). DAI-A 58(04), p. 1216, 1997. [AAT9730237]

Findings reveal that female scientists considered the doctoral chairperson furnishing career enhancing mentoring more important than did the men. Female scientists were not as satisfied as men with their chairperson providing most of the career enhancing and psycho-social mentoring functions.

gen, car, ats (PS)

Ford, Brenda Jordan. (1997). ***The perception of science department chairs regarding the performance of community college science majors transferring to 4-year institutions*** (The University of Alabama). DAI-A 58(06), p. 2043, 1997. [AAT9735701]

Results showed that chairs perceived significant differences in native and transfer students. The differences found became greater as the size of the institution increased and became less the greater the number of transfer students attending an institution.

att, bft, bkg (PS)

Foster, John Curtis. (1997). ***The relationships between integration strategies and student achievement scores in science among the non-college bound in Pennsylvania*** (The Pennsylvania State University). DAI-A 58(07), p. 2616, 1998. [AAT9802633]

The purpose of this study was to explore the relationship between the perceived level of integration between science and vocational subject areas and scores on the NAEP. Results indicate that the use of vocational methodologies helped students consistently score higher.

ach, ped, int, gen, cur (HS)

Freedman, Robin Lee Harris. (1997). ***Assessment practices of Iowa science teachers from a constructivist perspective*** (The University of Iowa). DAI-A 58(08), p. 0001, 1998. [AAT9805670]

Science teachers in Iowa's SS&C program had different perceptions regarding grading philosophies and the use of traditional and non-traditional assessments than those of other Iowa science classrooms. Also, SS&C students perceived that they had an active role and voice in assessment.

bft, asm, cns, ats (TE)

Freund, Judith Ann. (1997). ***Landscapes of promise: An examination of students' journals written during a cross-cultural wilderness experience*** (University of St. Thomas). DAI-A 58(04), p. 1237, 1997. [AAT9730416]

The examination of the journals focused on the following areas: aesthetic 'peak' experiences; spiritual inspiration derived from experiences in nature; attitudes toward the preservation of wildlife; and environmental ethics.

mce, fsd, ats, int, nfd, bkg (HS)

Gabel, Dorothy. (1997). ***Gender issues in graduate science success*** (Indiana University). DAI-A 58(09), p. 3463, 1998. [AAT9810781]

Female students perceived their working environment more negatively than males. The science department with the highest overall graduate student attrition rate also had a smaller percentage of female students and faculty, and was seen by female students, but not by male students or by faculty, as a less supportive environment.

gen, car, ats, att (PS)

Gardner, William Ryland, III. (1997). ***Ecological field research and environmental education*** (Prescott College). MAI 36(01), p. 0032, 1998. [AAT1386740]

Ecological field research in the context of this paper refers to short (1-7 day) field research projects involving students. The justification for using field research is examined and examples of its application are provided. The uses of field research are related to the five objectives of EE set forth by the Tibilisi Declaration (1978).

fsd, ene, ped (ALL)

Gavin, Andrea Robin. (1997). ***Increasing students' retention of science vocabulary using music*** (Texas Woman's University). MAI 35(05), p. 1130, 1997. [AAT1384838]

Even though results show no significant differences in mean scores for the groups, the scores of the treatment group showed less of a decrease than scores for the control group after one month.

int, ach, esg, bkg (EL)

George, Rani. (1997). ***Multivariate latent variable growth modeling of attitudes toward science: An analysis of the longitudinal study of American youth*** (University of Delaware). DAI-A 58(07), p. 2614, 1998. [AAT9800025]

Results of the multivariate model showed that over the middle and high school years, changes in attitudes toward science were positively related to changes in attitudes about the utility of science.

ats, nas, bkg, cht (SE)

Gillespie, Katherine Beattie. (1997). ***Water canaries' effect on student knowledge and attitude toward aquatic resources*** (University of Louisville). MAI 36(01), p. 0032, 1998. [AAT1387077]

From both qualitative and quantitative measures, the researcher concluded that this activity of the Kentucky Department of Fish and Wildlife's Aquatic Education Program had a positive effect on both the attitude and knowledge of sixth graders who participated in the program.

ats, kns, nfd, ntw, ene (MS)

Giuliano, Frank Joseph. (1997). ***The relationships among cognitive variables and students' problem-solving strategies in an interactive chemistry classroom*** (Syracuse University). DAI-A 59(01), p. 0125, 1998. [AAT9821612]

Results indicate that students who had similar cognitive profiles often used similar problem-solving strategies when individually solving problems. Students exhibited considerable changes in the relative frequencies of their problem-solving strategy use over three instructional units.

pbs, kns, ped, che, lsy (HS)

Glenn, Janie Marble. (1997). ***An analysis of the effect of intensive instruction on chemistry achievement and mental development of students in a summer bridge program*** (University of Pittsburgh). DAI-A 58(06), p. 2141, 1997. [AAT9735955]

The subjects' high school mathematics grade averages were more significantly related to their performance and achievement in the chemistry course than were composite SAT scores, high school grade point averages or science grades. The short-term intensive instruction affected two types of growth: "learning" and "development."

che, ach, lrg (PS)

Goebbel, Brenda. (1997). ***Lessons on electromagnetic fields: An evaluation of research, policy, and public concern for use in high school science courses in southeastern Michigan*** (Eastern Michigan University). MAI 36(02), p. 0497, 1998. [AAT1387285]

This study evaluated current research on and public attitudes toward electromagnetic fields and incorporated this information into classroom lessons to be used when teaching electricity, magnetism, and the electromagnetic spectrum to high school students.

phy, sts, cur (HS)

Goldsmith, Dennis Arthur. (1997). ***The influence of the implementation of a science reform initiative: Teachers' perceptions and development of levels of concerns*** (The University of Alabama). DAI-A 58(06), p. 2078, 1997. [AAT9735704].

The study revealed that teachers developed higher levels of concern with continued staff development. Teachers who experienced continued staff development reported higher levels of expertise in using the science modules and increased use of the science modules.

tpd, skt, ref, att, hos (TE, EL)

Golley, Pricilla Sue. (1997). ***An investigation of teachers' perceptions and implementation of interdisciplinary mathematics and science*** (Georgia State University). DAI-A 58(08), p. 3071, 1998. [AAT9804386]

Participants believed that interdisciplinary curricula require changes in technique or approach toward teaching and are valuable in presenting 'real world' problems to students. Levels of discomfort were believed to be due to unfamiliarity with content, working in teams, and with the process of interdisciplinary teaching and learning.

int, bft, cur, ped (TE, HS)

Gonzalez, Mary-Helen C. (1997). ***Learning English through science*** (Texas Woman's University). MAI 36(03), p. 0660, 1998. [AAT1388046]

Twenty-four students in a third grade heterogeneous bilingual class in a large inner-city school were used in this study. A significant increase in oral and written English proficiency occurred among the students during the period of the two science units.

mce, int, hos (EL)

Gordin, Douglas Norman. (1997). ***Scientific visualization as an expressive medium for project science inquiry*** (Northwestern University). DAI-A 58(11), p. 4242, 1998. [AAT9814216]

Using videotapes of group interactions, software logs, and students' work, the study examined students' representational and inquiry strategies. By creating the visualization the students engaged in a process of meaning-making that included interweaving prior experiences and beliefs with the representations they are using.

rem, edt, inq, cpl, bio, bfs (HS)

Gray, Derek John. (1997). ***Mathematics and science in South Africa: An international achievement study at junior secondary level*** (University of Pretoria). DAI-A 58(11), p. 4214, 1998. [Not Available from UMI]

South African students displayed a poor mastery of fundamental processes and of number sense in mathematics, although the curriculum covered a reasonable range of the TIMSS question fields. In the sciences, a lack of understanding of fundamental concepts and problem solving abilities was displayed.

res, ach, cur, ref, ped (MS)

Griffin, Georgia Inez Hunt. (1997). ***Informal schooling and problem-solving skills in second-grade science: A naturalistic investigation*** (Widener University). DAI-A 59(04), p. 1055, 1998. [AAT9829299]

The purpose of this study was to explore how 15 African American children solved problems in second grade science. Their ability to observe, classify, recall, and perceive space/time relationships was assessed. Think-aloud protocols were used for this examination.

pbs, eth, bkg, lsy (EL)

Griffin, Leslie Little. (1997). ***Relationships among selected physical science misconceptions held by preservice elementary teachers and four variables: Formal reasoning ability, working memory capacity, verbal intelligence, and field dependence/independence*** (The University of Mississippi). DAI-A 58(04), p. 1249, 1997. [AAT9729776]

The variables of formal reasoning ability and verbal intelligence were identified as having significant relationships, both individually and in combination, to the dependent variable of selected physical science misconceptions.

phy, alf, cht, tpd, ccg (TE, EL)

Gruner, Heidi Mauk. (1997). ***A study of the cognitive and affective impact of the cockpit physics curriculum on students at the United States Air Force Academy*** (Kansas State University). DAI-A 58(06), p. 2142, 1997. [AAT9736732]

This study attempted to determine whether an interactive student-centered environment provided the social context and community for learning needed by students who do not traditionally purse a career in science.

phy, ped, cpl, cbi, int, gen (PS)

Hall, Linda R. (1997). ***Mathematics and science achievement in adolescence: The effects of life course goals and self-concept*** (University of Toronto). MAI 36(06), p. 1447, 1998. [AATMQ28710]

Mathematics self-concept, academic self-concept, and time on mathematics were consistently significant predictors of mathematics and science achievement for the full sample (n=522) of high school students. The patterns varied somewhat by gender and educational experience.

ach, bfs, ats, bkg, gen (HS)

Hamilton, Laura S. (1997). ***Construct validity of constructed-response assessments: Male and female high school science performance*** (Stanford University). DAI-A 58(07), p. 2614, 1998. [AAT9802050]

This study investigated the validity of multiple-choice and constructed-response science items from the National Education Longitudinal Study of 1988. Identifying characteristics of items that exhibited gender differences was a priority. This study showed the value of a careful validity evaluation, and that differences among items within a format may be as large or larger than differences between formats.

asm, gen, ach, lsy (HS)

Hanley, Carol Diane. (1997). ***The effects of the learning cycle on the ecological knowledge of general biology students as measured by two assessment techniques*** (University of Kentucky). DAI-A 58(06), p. 2052, 1997. [AAT9735605]

This study was undertaken to compare the effectiveness of the learning cycle method of instruction with a more traditional method on increasing student knowledge of selected ecology topics. Results were mixed.

ped, lrg, lth, ene, asm (HS)

Harding, Jean Bridget. (1997). ***The effect of an outdoor residential environmental education program on the development of grade seven students' environmental attitudes and ecological knowledge*** (Memorial University of Newfoundland). MAI 36(02), p. 0331, 1998. [AATMQ23141]

This study used questionnaires and an ecological knowledge test to suggest that the educational effectiveness of the outdoor residential program on ecological knowledge was significant. The effect decreased a year later although not to original levels. The outdoor program did not significantly change environmental attitude.

lrg, ats, ene, fsd, gen (MS)

Hariharan, Joya Reena. (1997). ***Science in the General Education Development (GED) curriculum: Analyzing the science portion of GED programs and exploring adult students' attitudes toward science*** (The Ohio State University). DAI-A 58(10), p. 3802, 1998. [AAT9813269]

Students in sites that use strategies such as group discussions and field trips appeared to be more aware of science in the world around them and more enthusiastic about increasing this awareness. GED science materials do attend to the relevance of science in everyday life but students' appreciation of this depends on the teaching strategies employed.

ats, cur, ped, lit, mat (AD)

Harlan, Ronald Keith. (1997). ***Community college biology majors: The dynamics of the successful community college transfer program. A comparative analysis of the program determinants which lead to high transfer success in community college biology transfer programs*** (University of California, Los Angeles). DAI-A 57(11), p. 4631, 1997. [AAT9714264]

This study compared two biology majors programs with high transfer success (HTS) to two programs with low transfer success (LTS). Qualitative methods were used in the analysis to establish common themes which existed at both the HTS and LTS programs.

bkg, cur, bio, lab (PS)

Harp, Shannon Frankie. (1997). ***How seductive details do their damage: A cognitive theory of interest in science learning*** (University of California, Santa Barbara). DAI-B 58(07), p. 3939, 1998. [AAT9800459]

Students who read passages containing seductive details recalled significantly fewer main ideas and generated significantly fewer transfer solutions than students who read a passage with no seductive details.

lth, lrg (PS)

Hau, Ho Huu. (1997). ***A teaching innovation to promote authentic science in a physics teaching laboratory in a Vietnamese university*** (Simon Fraser University). MAI 36(03), p. 0675, 1998. [AATMQ24155]

A teaching innovation using a problem-solving approach to promote authentic science in the physics laboratory was developed and implemented. Students reflected on surprising events to shape their understandings of phenomena, constructed new meanings of concepts, and developed practical knowledge during the course.

lth, ped, cns, phy, pbs (PS)

Havasy, Ray Ann De Presco. (1997). ***The effect of informal science experiences on science achievement and attitude of high school biology students*** (Columbia University Teachers College). DAI-A 58(05), p. 0001, 1997. [AAT9735079]

Secondary biology students from five classrooms were studied for the effect of two informal science experiences on achievement and attitude toward science. Both attitude and achievement scores were higher for those students attending informal science institutions.

nfd, ach, ats (HS)

Hays, Irene de la Bretonne. (1997). ***Toward an essential ethic for teaching science in the new millennium*** (Seattle University). DAI-A 59(07), p. 2430, 1999. [AAT9842069]

Historical philosophies and theories of the nature of, value of, and human relationship with Nature were reviewed. The philosophies practicing scientists were compared to those of Nature Writers for analysis of similarities and differences.

phe, ene, his (GEN)

Hazari, Alan A. (1997). ***A survey of specific individualized instruction strategies in elementary science methods courses in Tennessee teacher education institutions*** (The University of Tennessee). DAI-A 59(07), p. 2430, 1999. [AAT9840304]

Tennessee teacher educators were found to regularly include a fair amount of the 31 identified teaching strategies for individualized instruction in preservice elementary education courses.

tpd, ped (EL)

Hein, Teresa L. (1997). ***Digital video, learning styles, and student understanding of kinematics graphs*** (Kansas State University). DAI-A 58(06), p. 0001, 1997. [AAT9736737]

There was no significant relationship between students' learning style preferences and their ability to interpret motion graphs. A gender bias may be inherent in the instrument due to differences in mean scores between males and females after controlling for differences by using SAT scores and course grades.

lsy, sks, phy, gen (PS)

Hemler, Debra A. (1997). ***Research experiences in teacher preparation: Effectiveness of the Green Bank preservice teacher enhancement program*** (West Virginia University). DAI-A 58(07), p. 0001, 1998. [AAT9802166]

Study examined the effectiveness of the Research Experience in Teacher Preparation (RETP) project aimed at enhancing teacher perceptions of the nature of science, science research, and science teaching. Student teachers who had initiated research in their classroom had fewer concerns about doing research.

tpd, nas, res (TE)

Henriques, Laura. (1997). ***A study to define and verify a model of interactive-constructive elementary school science teaching*** (The University of Iowa). DAI-A 58(12), p. 0001, 1998. [AAT9819946]

In an effort to enable elementary teachers to move toward an interactive-constructivist model, the Science Education Center at the University of Iowa collaborated with a local school district. Newer teachers and those who were philosophically aligned with the project were more likely to implement the project.

tpd, cns, ped (TE, EL)

Hepburn, Gary Roy. (1997). ***Working the network: Initiating a new science and technology course*** (The University of British Columbia). DAI-A 58(06), p. 0001, 1997. [AATNN19591]

This study explored a new applied high school physics course aimed at being more responsive to the workplace. Using actor-network theory and sociocultural theory, the researcher found that the networks had only a minor connection. Implications for policy of educational change initiatives are introduced.

cur, ref, phy, ntw (HS)

Heron, Lory Elen. (1997). ***Using constructivist teaching strategies in high school science classrooms to cultivate positive attitudes toward science*** (University of Nevada, Reno). DAI-A 58(05), p. 0001, 1997. [AAT9731468]

Constructivist teaching strategies were investigated along with grades from science class and scores from high school students (n=249) on the Science Attitude Assessment Tool (Heron & Beauchamp, 1996). Students in constructivist classes had lower grades and a more positive attitude.

cns, ats, ach (HS)

Hildreth, David P. (1997). ***Learning to teach science in a professional development school program*** (The University of North Carolina at Greensboro). DAI-A 58(04), p. 0001, 1997. [AAT9730003]

After three semesters at the Professional Development School program, preservice teachers had improved attitudes toward science teaching, higher achievement in process skills and more efficacious beliefs. Most effective were the collaborative cohort team and extended clinical internships.

att, bft, skt, tpd (TE)

Hill, Gary D. (1997). ***Conceptual change through the use of student-generated analogies of photosynthesis and respiration by college non-science majors*** (University of Georgia). DAI-A 58(06), p. 0001, 1997. [AAT9735480]

In order to study conceptual change in an introductory biology course, the Instrument for the Assessment of Respiration and Photosynthesis (IFARP) was developed. No significant changes were observed in non-majors' performance, but there was a statistical increase in mean confidence levels.

ccg, bio (PS)

Hill, Gloria Pinckney. (1997). ***The experiences of African-American students majoring in engineering: Cognitive, non-cognitive, and situational aspects*** (University of Pittsburgh). DAI-A 58(06), p. 2103, 1997. [AAT9735958]

Redefinition of "academically successful" was an effective coping mechanism for African-American engineering majors. The perception of their ability among non-minority peers; assertive utilization of resources and services; the existence of a critical mass of African-American students, and participation in study groups were thought to affect success.

eth, tec, ach, car (PS)

Hirst, Sabine Korpus. (1997). ***The effects of a formal notebook on learning achievement of tenth-grade biology students*** (Florida Institute of Technology). DAI-A 58(04), p. 0001, 1997. [AAT9730126]

Students (n=126) from two schools regarded formal notetaking as a valuable tool for preparing for tests and keeping up with homework. An analysis of variance for school means indicated statistically significant differences on the posttest between treatment and control group classes.

sks, ach (HS)

Hitt, Kathleen Milligan. (1997). ***Chance, choice and opportunity: Life history study of two exemplary female elementary science teachers*** (University of Wyoming). DAI-A 58(04), p. 0001, 1997. [AAT9730356].

This two-year case study investigated why two female elementary teachers became exemplary science teachers by using confluence theory to compare their life stories. Four major categories were considered: risk-taking; life-long learning; gender equity and mentors.

gen, eqt, tpd (TE)

Hoffman, Beth A. (1997). ***Social interaction and conceptual understanding in computer-based physics*** (Harvard University). DAI-A 58(05), p. 0001, 1997. [AAT9734799]

Seventy-six high school physics students were paired in computer-based instruction. The ability to effectively negotiate solutions was associated with higher achievement, implying that educators should consider training students in resolution skills prior to collaborative instruction.

cpl, cid, cbi, phy, ach (HS)

Hoffmann, Johannes Oswald. (1997). ***Identification of the critical elements of environmental literacy: A Delphi study*** (Texas A&M University-Commerce). DAI-B 58(08), p. 0001, 1998. [AAT9806300]

The Delphi technique was utilized to identify, rank, and refine 59 critical elements of environmental literacy by surveying environmental experts.

ene, lit (GEN)

Hogan, Kathleen. (1997). ***Thinking aloud together: A test of an intervention to foster middle school students' collaborative scientific reasoning*** (State University of New York at Albany). DAI-A 58(07), p. 0001, 1998. [AAT9802407]

This study evaluated an intervention called Thinking Aloud Together embedded within a 12-week unit of building mental models of the nature of matter. Students gained in metacognitive knowledge of and ability to articulate their collaborative reasoning behavior.

cpl, kns, cid, rem (MS)

Horton, Nancy Carnell. (1997). ***Challenges to first year secondary science teachers*** (The University of Alabama). DAI-A 58(06), p. 0001, 1997. [AAT9735714]

A focus-group identified challenges and needs of first year science teachers. Participants cited the problems of teaching heterogeneous groups, inadequate facilities, little administrative support, scheduling and time management, and lack of peer support.

tpd, att (TE, HS)

Howes, Elaine Virginia. (1997). ***Feminist teacher research and students' visions of science: Listening as research and pedagogy*** (Michigan State University). DAI-A 58(09), p. 0001, 1998. [AAT9808090]

Using methodologies derived from teacher research and feminist research, this study explicates the resonances and dissonances between students' ideas, standards' goals, and feminist theory in order to deepen the understanding of students' thinking about the activities and knowledge of science.

bfs, ref, phe, kns, gen (GEN)

Hsi, Sherry Hsiao-Rai. (1997). ***Facilitating knowledge integration in science through electronic discussion: The multimedia forum kiosk*** (University of California, Berkeley). DAI-A 58(08), p. 0001, 1998. [AAT9803228]

This study investigated whether electronic discussion could improve scientific discourse among students, support knowledge integration, and enhance conceptual understanding. Specific recommendations are offered for the design of productive electronic discussion and future collaborative learning environments.

edt, ntw, cid (PS)

Hsu, Shih-Jang. (1997). ***An assessment of environmental literacy and analysis of predictors of responsible environmental behavior held by secondary teachers in Hualien County of Taiwan*** (The Ohio State University). DAI-A 58(05), p. 0001, 1997. [AAT9731641]

Based on the Hines and the Hungerford and Volk models and the environmental literacy framework proposed by the Environmental Literacy Assessment Consortium, this study determined the contributions of nine variables in teachers' environmental responsibilities. Implications for environmental education program development and instructional practice are presented.

ene, tpd (TE)

Hsu, Ying-Shao. (1997). ***Development and formative evaluation of an instructional simulation of adiabatic processes*** (Iowa State University). DAI-A 58(11), p. 0001, 1998. [AAT9814652]

This research examined university students' conceptual development, problem solving and transfer in a beginning meteorology course. A serious weakness in students' problem-solving skills was revealed as well as the value of the computer-based simulated environment for revealing those weaknesses.

cbi, pbs (PS)

Hsueh, Tung-Guang. (1997). ***Teachers' beliefs about the role of socially relevant issues in teaching the nature of science*** (The Ohio State University). DAI-A 58(10), p. 0001, 1998. [AAT9813274]

Results show that high school teachers used socially relevant issues to teach the tentative nature of science, the role of individual scientists in validating scientific knowledge and the social aspects of science. The role of scientific communities in validating scientific knowledge was often neglected in the classroom.

bft, nas (TE)

Huntley, Mary Ann. (1997). ***Integrated mathematics and science education in the middle grades: Theory and practice*** (University of Maryland College Park). DAI-A 58(09), p. 0001, 1998. [AAT9808616]

This research addresses the ill-defined nature of the phrase "integrated mathematics and science education." A conceptual framework gives clarity and precision to this phrase. Discussed are: transition from a separated to an integrated approach, teacher preparation, and different conceptions of each discipline.

int, tpd (MS)

Huong, Tran Thi Thien. (1997). ***A combination of physics lectures and demonstrations using the learning cycle in physics teaching at the College of General Studies, National University of Ho Chi Minh City*** (Simon Fraser University). MAI 36(03), p. 0675, 1998. [AATMQ24255]

The pilot teaching of the design was implemented to investigate how well students understand concepts and principles of physics, their perceptions of applying these principles into technology, as well as their attitudes toward studying physics.

kns, phy, ats, bfs, tec (PS)

Hurd, David William. (1997). ***An analysis of the critical other versus the catalytic agent in novel instructional resources*** (Cleveland State University). DAI-A 58(05), p. 0001, 1997. [AAT9732751]

For second grade students (n=394) the classroom teacher was favored at novel instructional sites. It is recommended that nonformal science sites provide training for teachers to lead their own classes through the site in order to reduce the distractiveness of the novel setting.

nfd, tpd (TE)

Hyde, Michelle Smoot. (1997). ***A case study of undergraduate female students majoring in math, science and engineering: An analysis of persistence and success*** (The University of Utah). DAI-A 58(10), p. 0001, 1998. [AAT9812969]

This study identified critical factors which contributed to female persistence in math, engineering, and science education. The study recommends collaborative learning processes and teaching methods, cohort involvement and study groups, professorial associations with students and internship and lab programs.

car, gen, ntw, cpl (TE)

Jacek, Laura Lee. (1997). ***Gender differences in learning physical science concepts: Does computer animation help equalize them?*** (Oregon State University). DAI-A 58(05), p. 0001, 1997. [AAT9734840]

In testing 332 university students, this study identified gender differences using three experimental treatments: animation, static graphics, and verbal instruction. Results showed that animation was better than static graphics in improving women's long-term learning, but not significant in short-term learning.

gen, lrg, cbi (PS)

Jelinek, David John. (1997). ***Student perceptions of the nature of science and attitudes towards science education in an experiential science program*** (University of California, Santa Barbara). DAI-A 58(09), p. 0001, 1998. [AAT9809631]

A six-week course using experiential learning was devised and delivered to 20 high school students. A model of nature of science enhancement was proposed: engagement in meaningful, extended activities; student accountability for active participation and reflectiveness; and emphasis of high interest values.

bfs, ats, nas (HS)

Jobe, Robert Dale. (1997). ***An assessment of inservice training on the Applications in Biology/Chemistry curriculum from the Center of Occupational Research and Development*** (Oklahoma State University). DAI-A 58(11), p. 0001, 1998. [AAT9815947]

This study assessed 62 participants' expectations and satisfaction with inservice training provided for certification in Oklahoma for five years. Insight was gained on the timeline, configuration, and structure of future workshops for teachers of Application in Biology/Chemistry for high school.

tpd, bio, che (TE, HS)

Johnson, Linda Wilken Graham. (1997). ***Improved memory retention and understanding of ecology concepts through the use of concept mapping in a seventh-grade science classroom*** (Texas Woman's University). MAI 35(05), p. 1131, 1997. [AAT1384843]

Instruction in concept mapping helped seventh-grade students retain and assimilate ecology concepts to a greater extent than a control group of students.

sks, lrg (MS)

Jones, Leslie Sandra. (1997). ***Race, gender, and marginalization in the context of the natural sciences*** (The Ohio State University). DAI-A 58(05), p. 0001, 1997. [AAT9731647]

This naturalistic study sought explanations for disproportionate representation in the professional scientific community and its impact on postsecondary and precollegiate science education. Emergent themes were: delusions of equity, myth of meritocracy, power of the pedigree, traditions of gender, and typing by race.

gen, eqt, car (GEN, PS)

Jones, Stanley Poindexter. (1997). ***The utilization of aerospace concepts, subject matter, and activities by elementary teachers*** (Oklahoma State University). DAI-A 58(08), p. 0001, 1998. [AAT9806553]

Participants (n=75 elementary teachers) in NASA's Langley Research Center rated this teacher enhancement program as very effective and used NASA's curriculum materials as a means of increasing hands-on activities in their classrooms.

cur, tpd, esg (TE, EL)

Keating, Thomas Michael. (1997). ***Electronic community: The role of an electronic network in the development of a community of teachers engaged in curriculum development and implementation*** (Stanford University). DAI-A 57(11), p. 0001, 1997. [AAT9714133]

A core group of schools was able to engage in interdisciplinary, long term, cross-site projects and student exchanges. Insights were gained as to the ingredients necessary to nurture an electronic network as teachers participate in electronic collaborations that will directly impact classroom learning.

ntw, tpd, int, cur (TE)

Keefer, Robert Kenneth. (1997). ***Projectile motion in physics: A survey assessment of retained understandings and how traditional and nontraditional adult college students believe they learned them*** (The Pennsylvania State University). DAI-A 58(05), p. 0001, 1997. [AAT9732300]

This study evaluated a researcher-developed activity on projectile motion as part of a trigonometry-based physics course. Participants who demonstrated a high level of long-term understanding rated laboratory activities as very important or extremely important to their understanding of projectile motion.

bfs, lab, lrg, phy (AD, PS)

Keller, Brenda Jo. (1997). ***Effect of three different types of high school class schedules (traditional, rotating block, and accelerated block) on high school biology achievement and on differences in science learning environments*** (University of North Texas). DAI-A 58(03), p. 0001, 1997. [AAT9727787]

The effects of traditional, rotating block, and accelerated block class scheduling on high school biology students were studied. During the first two years of block scheduling lower student achievement scores but more positive student attitudes and perceptions about science learning were reported.

ped, ach, ats, bio (HS)

Kesselheim, Craig. (1997). ***Description and analysis of assistance in science teaching reform: The reports of Maine's Beacon Center Science Facilitators and the teachers they help*** (University of Maine). DAI-A 58(04), p. 0001, 1997. [AAT9729624]

This study described the assistance relationship between 14 teachers engaged in school-based education reform and three full time facilitators. Types of assistance and impact of facilitator assistance on teachers' practice are reported along with implications for designing facilitator-teacher assistance relationships.

tpd, ntw, ref, ped (TE)

Killebrew, Charles J. (1997). ***Teacher conceptions and the curriculum: A longitudinal, multicase study of college chemistry teaching*** (The Louisiana State University). DAI-A 59(01), p. 0001, 1998. [AAT9820729]

College student interviews suggested that students who took conceptual chemistry classes were better able to recall and apply concepts. Their performance equaled the traditional students' on both research tests and on multiple-choice final examinations. They also had more positive attitudes and a greater completion rate.

cur, ats, lrg, che, ped (PS)

Kim, Norma B. (1997). ***A comparison of the effects of computer-enhanced with traditional instruction on the learning outcomes of high-school students in anatomy classes*** (University of Pittsburgh). DAI-A 59(01), p. 0001, 1998. [AAT9821259]

This study assessed the effects of computer-enhanced instructional software on student learning in two high school anatomy classes. There was no difference in posttest scores on an endocrine unit; however, visually perceptive students and students with high persistence scored significantly higher.

cbi, bio, lrg (HS)

Kizito, Rita Ndagire. (1997). ***An investigation into the utilisation of educational media by primary school science teachers in Mankwe District in the Northwestern Province*** (Univeristy of South Africa). MAI 36(03), p. 0679, 1998. [Not Available from UMI]

A survey of primary teachers found that facilities for educational technology use were in need of improvement, and science teachers would need to be further motivated to routinely incorporate educational technology into classrooms.

edt, att (EL)

Kochheiser, Karen Lynn. (1997). ***An analysis of women's ways of knowing in a 10th grade integrated science classroom*** (The Ohio State University). DAI-A 58(07), p. 0001, 1998. [AAT9801727]

Ways that nine women learned science were situational and are described in terms of Belenky, Clinchy, Goldberger, and Tarule's *Women's Ways of Knowing*. Women gained an awareness of how they learn science and how that awareness can be used to make them even more successful in the classroom.

gen, lrg, int (HS)

Kosten, Lora Bechard. (1997). ***The effectiveness of family science and technology workshops on parental involvement, student achievement, and student curiosity*** (Salve Regina University). DAI-A 58(10), p. 0001, 1998. [AAT9813177]

This study evaluated the effects of family workshops on 35 elementary children's science interest and achievement as well as on parents' collaboration in their child's education. There were no statistical differences on science achievement, curiosity, or parental involvement.

bkg, nfd, ats, ach, tec (GEN, EL)

Koul, Ravinder. (1997). ***Contextualized science? An Indian experience*** (The Pennsylvania State University). DAI-A 58(07), p. 0001, 1998. [AAT9802678]

Results of this investigation indicated that the centralized curriculum in India has undermined context-specific treatment of subject matter in the National Council of Educational Research and Training textbooks.

cur, mat (GEN)

Kowitz, Angela. (1997). ***Application of concept maps by middle school science teachers*** (Christopher Newport University). MAI 36(01), p. 0019, 1998. [AAT1386962]

The purpose of this study was to ascertain the awareness and utilization of concept mapping as an instructional tool among middle school science teachers and to examine how these middle school science teachers incorporated concept mapping into daily lessons.

ped, skt (TE, MS)

Kraus, Pamela Ann. (1997). ***Promoting active learning in lecture-based courses: Demonstrations, tutorials, and interactive tutorial lectures*** (University of Washington). DAI-A 58(06), p. 0001, 1997. [AAT9736313]

This research focused on improving learning in introductory lecture-based physic courses. The guided inquiry approach which proved effective in small-group tutorials could be successfully adapted for large lecture courses to teach two-dimensional motion, forces and Newton's laws, and magnets and charge.

inq, ped, phy (PS)

Krieger, Carla Repsher. (1997). ***Relationships among process skills development, knowledge acquisition, and gender in microcomputer-based chemistry laboratories*** (Lehigh University). DAI-A 58(05), p. 0001, 1997. [AAT9732870]

This study investigated how microcomputer-based chemistry laboratory environments were designed to facilitate process skill development and knowledge acquisition among 98 high school chemistry students. However, no significant effects on process skills attributable to treatment or gender were identified.

lab, lrg, cbi, gen, sks, che (HS)

Krusenklaus, Heidi Elizabeth. (1997). ***Evaluation of a time-saving team laboratory report assessment*** (Michigan State University). MAI 36(01), p. 0032, 1998. [AAT1386874]

Biology labs were created and adapted for advanced students. A tool for assessing student scientific laboratory reports was developed and found to be valid and fair.

asm, cur, bio (HS)

Krylova, Irina. (1997). ***Investigation of causes of differences in student performance on the topics of stereochemistry and reaction mechanisms in an***

undergraduate organic chemistry course (The Catholic University of America). DAI-A 58(02), p. 0001, 1997. [AAT9722639]

This study determined possible reasons for student failure in undergraduate organic chemistry courses; particularly, student difficulties in understanding stereochemistry and reaction mechanisms. Knowledge of general chemistry was the most important variable in student performance. Misconceptions are reported.

alf, che, kns, ach (PS)

Kudukey, John Henry. (1997). ***An evaluation of UPDATE: A study of the effect of participation in a teacher enhancement program on secondary physics instruction*** (University of Massachusetts). DAI-A 58(06), p. 0001, 1997. [AAT9737552]

This study reports on the UPDATE program, a physics teacher enhancement program offered by the University of Massachusetts which included laboratory experiences. Participants became more confident, enthusiastic, gained more physics knowledge, and changed their teaching practices.

tpd, phy, lab, ped (TE, SE)

Kuehne, Carolyn C. (1997). ***Effects of teacher and student-constructed graphic postorganizers on science achievement for students with learning disabilities*** (University of New Orleans). DAI-A 58(08), p. 0001, 1998. [AAT9807502]

This study evaluated the effectiveness of student-constructed graphic postorganizers as used by 35 fifth grade science students with learning disabilities. While the treatment group scored significantly higher the results are tenuous because of the moderate-to-low reliability of the pre-and post-science mastery tests.

ped, chs, ach (EL)

Kujawinski, Daniel Bernard. (1997). ***Assessment and evaluation of science process skills in secondary school biology laboratories*** (State University of New York At Buffalo). DAI-A 58(01), p. 0001, 1997. [AAT9719141]

This study examined how student science process skills may be accurately and reliably evaluated using a set of laboratory activities developed for secondary biology students. The treatment group demonstrated statistically better skills on 15 of 20 individual process assessments.

sks, asm, lab, bio (SE)

Lamb, Margaret Ann. (1997). ***Rethinking opportunities for special needs students to learn: A case study of collaboration between special and general educators*** (Michigan State University). DAI-A 58(09), p. 0001, 1998. [AAT9808114]

This study tells the story of two high school science teachers and one special education teacher and their collaborative efforts to develop a science curriculum for all students including those with disabilities. Implications for similar journeys of reform are described.

chs, eqt, cur, ntw, ref (HS)

Langmaid, Kimberly F. (1997). ***Educating for a sense of place: The power of place-based environmental education*** (Prescott College). MAI 36(01), p. 0019, 1998. [AAT1386748]

This study explored the notion of a sense of place and provides an explanation for why it ought to be addressed in educational systems. Ideas for implementing community-based educational programs which foster a sense of place are presented.

bfs, ene, phe (ALL)

Lavender, Linda. (1997). ***A history of nature study in Texas*** (Texas Woman's University). MAI 35(05), p. 1131, 1997. [AAT1384846]

The history of the implementation and goals of nature study in Texas was researched and described.

fsd, his (GEN)

Lavigne, Susan Rosemary. (1997). ***The effect of the Florida EXPLORES! Programs on the science process skills of fourth grade students*** (University of Central Florida). DAI-A 58(10), p. 0001, 1998. [AAT9812243]

Florida's EXPLORES! ground station was utilized and incorporated into numerous interdisciplinary lessons. Participants scored significantly higher on process skills scores after one school year.

sks, int, cur, ene (EL)

Lawlor-Lopez, Elizabeth G. (1997). ***A descriptive study of the reasons why elementary school teachers do not teach science*** (Texas Woman's University). MAI 36(03), p. 0667, 1998. [AAT1388054]

This study used a survey (n=100) to evaluate crucial areas involved in science instruction in 12 Catholic elementary schools. The areas of environment, equipment, supplies and resources, teacher training, and teacher attitude were shown to be important factors in teachers' decisions not to teach science.

att, tpd, mat, skt, bkg (EL)

Lawrence, Lettie Carol. (1997). ***The effects of an integrated algebra I/physical science curriculum on student achievement in algebra I, proportional reasoning and graphing abilities*** (North Carolina State University). DAI-A 58(06), p. 0001, 1997. [AAT9737656]

After one school year, 61 ninth grade students showed no significant differences in algebra I achievement, proportional reasoning and graphing abilities between an integrated algebra I/physical science curriculum and a non-integrated traditional algebra I curriculum.

int, cur, ach (HS)

Lawrence, Michael John. (1997). ***The effect of providing feedback on the characteristics of student responses to a videotaped format for high school physics assessment*** (Rutgers The State University of New Jersey - New Brunswick). DAI-A 58(05), p. 0001, 1997. [AAT9730857]

This study found that high school physics students (n=64) were unable to use feedback to make a significant change in the quality of their responses on six items on the Optics Videotape Assessment and ten optics multiple choice items from the National Physics Exam.

asm, sks, phy (HS)

Lee, Cherin Ann. (1997). ***A qualitative characterization of an introductory college nonmajors biology laboratory*** (Kansas State University). DAI-A 58(08), p. 0001, 1998. [AAT9804369]

The social aspects of learning, the collaborative and cooperative nature of laboratory work and learning, and the role of self-efficacy emerged as important factors in characterizing nonmajors' biology laboratories. Additionally, six factors emerged which parallel J. J. Schwab's four conditions of a curriculum.

bio, lab, cur (PS)

Lee, Pei-Ling Hsieh. (1997). ***Integrating concept mapping and metacognitive methods in a hypermedia environment for learning science*** (Purdue University). DAI-A 58(09), p. 0001, 1998. [AAT9808479]

Based on a constructivist perspective, four versions of a hypermedia-based genetics tutorial and problem solving program were developed. Findings indicated that both concept maps and metacognitive cues can enhance student learning and that students liked learning in a hypermedia-based environment.

edt, pbs, cns, lrg (SE, PS)

Lee, Shu-Wen. (1997). ***Assessment of effect of field trips on students' achievement and attitudes toward field trips in college biology*** (University of Northern Colorado). DAI-A 58(04), p. 0001, 1997. [AAT9729066]

Students in field trip groups had higher achievement as measured by quiz scores than those in the laboratory groups, but they held less favorable attitudes toward field trips.

fsd, ach, lab, bio, ats (PS)

Lemburg, Rebecca L. (1997). ***The integration of environmental education and wilderness-based adventure programs*** (Prescott College). MAI 35(04), p. 0939, 1997. [AAT1383700]

Ecological sustainability and the recreational use of wild lands were meshed into one model of integration in environmental education. Outdoor, adventure and experiential education in wild-life based courses provided a complete conduit for effective environmental education.

ene, fsd (ALL)

Lewis, Bradford F. (1997). ***The influence of world view on African-American college students' decisions to study science: An interpretive investigation of four cases*** (The Florida State University). DAI-A 58(01), p. 0001, 1997. [AAT9719277]

This study attempted to deepen current understanding of the career decisions of African-American students. Findings indicate that the science major has a greater capacity than the non-science major to accommodate world view images and assumptions about science that conflict with other images and assumptions.

eth, car, lth, bkg (PS)

Lieu, Sang-Chong. (1997). ***Teacher understanding of the nature of science and its impact on student learning about the nature of science in STS/ constructivist classrooms*** (The University of Iowa). DAI-A 58(08), p. 0001, 1998. [AAT9805694]

Findings supported the view that teachers who know more about the nature of science and who practice many STS/constructivist teaching strategies assist students in learning more about the nature of science.

nas, sts, cns, tpd (TE)

Lipman, Debra. (1997). ***The many faces of science: A qualitative study of female elementary preservice teachers' comfort with science*** (Queen's University at Kingston). MAI 36(01), p. 0033, 1998. [AATMQ20665]

Study participants felt their science background was lacking in both content and pedagogical knowledge. A hands-on approach helped them to see science as more accessible. Some participants believed that science methods courses should introduce the history and philosophy of teaching methods.

tpd, nas, hos, ped, knt (TE, EL)

Logan, Laverne K. (1997). ***A qualitative analysis of the non-verbal and verbal interactions of low achieving students in two contrasting science instructional settings*** (The University of Iowa). DAI-A 58(08), p. 0001, 1998. [AAT9805697]

This study investigated two contrasting science instructional settings: teacher-centered, textbook-dominated instruction and student-centered, materials-dominated instruction. Levels of behavioral involvement of low achieving students may be enhanced by increased structuring of the science learning environment.

ped, chs (ALL)

Loh-Yeo, Wan Inn. (1997). ***A study of primary science teachers' ability to restructure knowledge in scientific texts*** (Rutgers The State University of New Jersey - New Brunswick). DAI-A 58(11), p. 4223, 1998. [AAT9815097]

This study investigated the ability of twelve high school graduates undertaking a teacher training course in Singapore to restructure knowledge in an unfamiliar scientific text. Able readers demonstrated an ability to restructure knowledge while less able readers did not.

skt, mat, knt, tpd (TE)

Longo, Ellen O. (1997). ***Academic and social dimensions of student experience: The high school science classroom*** (University of California, Riverside). DAI-A 58(08), p. 0001, 1998. [AAT9804271]

This study focused on how students think and feel about classroom experiences. Findings indicated that about 45% of students withdraw on some academic or social measure, about 50% waffle between engagement and withdrawal and only 5% are enthusiastic about science.

bkg, ats, bfs, ach (HS)

Lopez, Efrain. (1997). ***Water cycle*** (California State University, Dominguez Hills). MAI 35(04), p. 0939, 1997. [AAT1383986]

Thirty minority students in the fifth and sixth grades scored high on a post-test after being instructed with a tutorial lesson on the earth's cycle of water.

esg, eth (MS)

Louden, Cynthia Knapp. (1997). ***Teaching strategies and student achievement in high school block scheduled biology classes*** (The University of North Carolina at Chapel Hill). DAI-A 58(12), p. 0001, 1998. [AAT9818375]

Teachers in block scheduled and traditional classes used inquiry-based instruction with nearly the same frequency. Thirty percent of teachers did not grasp the meaning of inquiry-based instruction. Significant achievement differences emerged between biology classes with frequent and infrequent uses of inquiry.

ped, ach, inq, bio (HS)

Love, Curtis Clinton. (1997). ***An exploratory examination of the predictors of success for a science education program enhanced by communication technologies: Contributions from qualitative and quantitative methods*** (The University of Alabama). DAI-A 59(01), p. 0001, 1998. [AAT9821549]

The University of Alabama's Center for Communication and Educational Technology developed an Integrated Science program for scientific illiteracy in middle schools. Despite extensive curriculum development and technologies, teachers were found to play the most critical role in determining a class's success.

int, lit, edt, cur, ped, tpd (MS)

Luckett, Pamela Gail. (1997). ***A comparison of African-American and Caucasian college students' attitudes toward computers*** (Florida Institute of Technology). DAI-A 57(12), p. 0001, 1997. [AAT9718037]

Both African American and Caucasian undergraduate students (n=230)showed a slight increase in their attitudes toward computers after completing a mandatory computer literacy course, but no significant difference between the groups was found.

tec, ats, cbi (PS)

Lynch, Mark D. (1997). ***The effects of cognitive style, method of instruction, and visual ability on learning*** (Iowa State University). DAI-A 58(03), p. 0001, 1997. [AAT9725436]

Relationships between cognitive style, instructional method, and visual skills were studied. Participants scored significantly higher on the kinetics portion if they were field dependent, had worked on computer lessons, and had high visual skills.

lsy, ped, sks (GEN)

MacDonald, Anthony Leo. (1997). ***Enacting science*** (University of Alberta). DAI-A 58(09), p. 0001, 1998. [AATNQ21595]

From an enactivist theoretical perspective on cognition, this study examined action-thought processes when middle-school students engaged in open-ended exploration in self-directed design and building with simple materials.

kns, lrg, inq (MS)

MacGowan, Catherine Elizabeth. (1997). ***An exploratory study into students' conceptual understanding of acid/base principles associated with chemical buffer systems*** (The University of Akron). DAI-A 58(10), p. 0001, 1998. [AAT9813625]

This study explored college students' conceptual understanding of acid/base principles related to comprehension and application of scientific concepts during a problem-solving activity. Students' misconceptions affected problem-solving performance.

alf, pbs, che, kns (PS)

Manhart, James Joseph. (1997). ***Scientific literacy: Factor structure and gender differences*** (The University of Iowa). DAI-A 58(12), p. 0001, 1998. [AAT9819962]

This study investigated the factor structure of scientific literacy in regards to gender differences. Females performed better items related to the social aspects of science while males performed better at recognizing the constructs of science. There was no gender difference for items dealing with life science.

lit, gen (ALL)

Marco, Pamela Lorraine. (1997). ***Barriers to environmental education: Perceptions of high school teachers in Orange County, California*** (California State University, Dominguez Hills). MAI 35(05), p. 1118, 1997. [AAT1384823]

Teachers had positive attitudes toward environmental education. However, their commitment to implement it was not positive. The most important barrier found to exist was the lack of environmental education resource material. This was followed by a lack of environmental education teacher training and knowledge.

att, ene, mat, tpd (TE, HS)

Marien, Tania N. (1997). ***Effects of Biology 131W on student learning in Biology 131 lecture*** (California State University, Fullerton). MAI 35(04), p. 0939, 1997. [AAT1384315]

The findings of this study suggest that student participation in an adjunct course that focuses on improving student learning through the teaching of study/learning techniques, content-related activities and reflective writing, can enhance student learning, understanding, and retention in an introductory biology course.

cur, sks, lrg, ped, bio (PS)

Maslin, (Louisa) Lin-Yi L. (1997). ***Self-regulated learning and science achievement in a community college*** (University of Southern California). DAI-A 58(05), p. 0001, 1997. [AAT9733096]

Self-regulated learning employed by college students (n=547) was examined by comparing basic and advanced science classes and non-science classes. There were no differences in self-regulated learning in different disciplines and the cumulative GPA was the only significant predictor of science achievement.

ach, lrg (PS)

Mattson, Susan Augusta. (1997). ***When world views collide: A study of interdepartmental collaboration to develop a biology course for prospective elementary school teachers*** (The Florida State University). DAI-A 58(11), p. 0001, 1998. [AAT9816186]

Characterization of course development emerged as originating from either traditional or progressive perspectives. Beliefs about collaboration also influenced course development.

bft, ntw, cur, bio, tpd (TE)

May, Theodore Scott. (1997). ***Elements of success in environmental education, through practitioner eyes*** (The University of Tennessee). DAI-A 59(01), p. 0001, 1998. [AAT9823106]

This two-phase study identified 42 elements that foster student growth in environment-related knowledge, attitudes, skills and responsible behaviors. A national survey of 500 teachers (response rate over 65%) confirmed these elements.

ene, att, bft, ats, sks (TE)

McBeth, William C. (1997). ***An historical description of the development of an instrument to assess the environmental literacy of middle school students*** (Southern Illinois University at Carbondale). DAI-A 58(06), p. 0001, 1997. [AAT9738060]

This study reports on the historical development and validity of The Middle School Literacy Instrument (MSELI) which assesses students' ability to identify environmental issues, knowledge of ecological principles, issue selection, self-reported knowledge of environmental actions, and action selection.

ene, asm, kns (MS)

McCauley, Enza Vitiello. (1997). ***A status study on the use of computer technology in instruction by Virginia secondary science teachers*** (University of Virginia). DAI-A 58(12), p. 0001, 1998. [AAT9820314]

This study determined the extent to which teachers perceived themselves as prepared to implement technology standards (National Science Education Standards and Standards of Learning for Virginia). Teachers (n=500) did not feel competent and expressed concern with computer shortages, training, and lack of time.

att, bft, tec, ref, tpd (TE, SE)

McFate, Craig Lane. (1997). ***Predicting success in general chemistry: The CSU Fullerton general chemistry placement test*** (California State University, Fullerton). MAI 35(04), p. 0939, 1997. [AAT1384321]

This study continues higher education's decades-long effort at improving performance in general chemistry by investigating the effectiveness of California State University, Fullerton's Chemistry Placement Test at predicting success in first-year chemistry.

ach, asm, che (PS)

McGaughey, James Albert. (1997). ***The impact of a commercially prepared science program on science education and scientific literacy among elementary students*** (University of Illinois at Urbana-Champaign). DAI-A 57(12), p. 0001, 1997. [AAT9717308]

The Windows on Science program was found to be useful in fourteen elementary schools either as a reference resource or as a prompt for teacher-mediated instruction for K-6 students.

ped, cur, lit (EL)

Meyer, Karen Mills. (1997). ***Catalysts and impediments to change in science teachers' beliefs and practices*** (The University Of Michigan). DAI-A 58(05), p. 0001, 1997. [AAT9732145]

This case study examined middle school teachers (n=3) as they learned a new model of pedagogy, project-based science. Beliefs and practice were intertwined as no teacher changed beliefs about the nature of science while modifying beliefs about the nature of learning. Beliefs colored perceptions of practice.

bft, ped (TE)

Michel-Clark, Isabella. (1997). ***A review of gender biases in seven high school science textbooks currently used in Washoe County, Nevada*** (University of Nevada, Reno). MAI 35(05), p. 1131, 1997. [AAT1384784]

A review of seven high school texts found that all texts were biased against females. The results of frequency counts showed significant differences between males and females in number of times scientists were mentioned, pictured, and covered in detail.

gen, mat (HS)

Miller, Jeffrey Alan. (1997). ***Plant trees in other people's yards: An investigation into the perspectives forming seventh-graders' understanding of an ecological and sustainable worldview, and possibilities for a curriculum to broaden these perspectives*** (Pacific Lutheran University). MAI 36(05), p. 1222, 1998. [AAT1390012]

The findings reveal that an environmental education curriculum which is grounded in Judeo-Christian beliefs has the capacity to make students more aware of their responsibilities and also illuminates that students have previously acquired these values through local forms of knowledge.

bfs, ene, bkg (MS)

Miller, Roxanne Greitz. (1997). ***Relationships between gifted selection criteria and performance in sixth grade gifted science*** (Florida International University). DAI-A 58(10), p. 0001, 1998. [AAT98l3425]

Combined SAT score and SAT Math Applications scores were significantly, positively correlated to performance in sixth grade gifted science (n=100). Performance scale I.Q. score was significantly, negatively correlated to performance. Females outperformed males to a highly significant level.

ach, chs (MS)

Minear, Nancy Ann. (1997). ***Choices in higher education: Majoring in and changing from the sciences*** (University of California, Irvine). DAI-A 58(03), p. 0001, 1997. [AAT9728084]

This study focused on female and under-represented minority students in science, engineering and mathematics. Performance as a predictor of terminal academic status was limited to only one gatekeeper course, Introductory Physics.

car, eth, gen, phy, bkg (PS)

Minner, Daphne Diane. (1997). ***Environmental education curriculum evaluation questionnaire: A reliability and validity study*** (The Pennsylvania State University). DAI-A 58(12), p. 0001, 1998. [AAT9817540]

Piaget's theory of cognitive development, Developmental Systems Theory, Life-Span Perspective and environmental education curriculum research were used to develop components included on a questionnaire evaluation. Face and content validity, but not criterion-related validity, were sufficiently demonstrated.

ene, cur (GEN)

Mitchell, Richard C. (1997). ***Student's understanding of chemical equilibrium as revealed by algorithmic and conceptual problems*** (Purdue University). DAI-A 58(12), p. 0001, 1998. [AAT9819003]

Teaching experiments may have contributed to advanced-placement students' increased understanding of the particle nature of chemical reactants and products, but not to their problem-solving methodologies. Patterns of problem-solving important to the research base were elicited from the data.

pbs, lrg, che (HS)

Mooney, Linda Beth. (1997). ***Scientific habits of mind: A reform of structure and relationships*** (University of Denver). DAI-A 58(04), p. 0001, 1997. [AAT9730344]

Scientific habits of mind overwhelmingly contributed to the current success of ten high school young scientists. These habits were developed through structures and relationships in the home where parents had provided a fun, playful, tolerant atmosphere in which messes and experimentation were the norm.

bkg (HS)

Morgan, Matthew Earle. (1997). ***Technology and Bloom's Taxonomy: Tools to facilitate higher-level learning in chemistry*** (Montana State University). DAI-A 58(11), p. 0001, 1998. [AAT9816318]

A learning model, data acquisition tools, and experiment writing templates were developed to provide many new ways of encouraging students to use critical thinking skills and to achieve higher-level learning. Shifting teaching paradigms can allow for technology to become a major aspect of the high-level learning environment.

sks, lrg, ped, edt, che (GEN)

Morgan, Peter Wallace. (1997). ***The effect of high school chemistry instruction on students' academic self-concept*** (Columbia University Teachers College). DAI-A 58(09), p. 0001, 1998. [AAT9810964]

There were no connections between chemistry grades and self-concept for students with strong academic self-concepts. Students (n=57) recommended that lab experiences be integrated with classroom work and expressed concerns about the algorithmic calculations associated with chemistry instruction.

bfs, ach, che, lab (HS)

Mueller, Jennifer Creed. (1997). ***Teacher beliefs in contemporary science education goals and classroom practice: The case of Souhegan High School*** (University of Lowell). DAI-A 58(12), p. 0001, 1998. [AAT9818824]

A strong teacher preference was reported for the contemporary goals of science education over past goals (n = 9). In addition, teachers showed a high degree of conviction in their belief in contemporary goals and a much lower degree of conviction in their belief in past goals.

bft, ped, ref (TE, HS)

Muire, Willis Christian, Jr. (1997). ***Analyses of science education reform in Florida: Emerging from the eclipse or trapped in the darkness?*** (The Florida State University). DAI-A 58(10), p. 0001, 1998. [AAT9813692]

A wide variety of qualitative and quantitative data sources were acquired and analyzed in a longitudinal, multi-level design to obtain rich insights into the factors associated with achievement and equity in the teaching and learning of science in Florida.

ach, eqt, ref (GEN)

Munroe, Elizabeth Ann. (1997). ***Enhancing the passing moments: An educational criticism of family visits to an early childhood science exhibition*** (University of Calgary). DAI-A 58(09), p. 0001, 1998. [AATNQ20758]

Specific features may facilitate learning during family visits to an early childhood science exhibition, "Working Wonders," at *The Science Centre* in Calgary, Alberta. Those features are represented in a set of guidelines for the development and evaluation of early childhood exhibitions.

nfd, asm (EC)

Myers, Robert Gardner. (1997). ***The interaction between the cognitive style of field dependence and visual presentations in color, monochrome, and line drawings*** (University of Pittsburgh). DAI-A 58(06), p. 0001, 1997. [AAT9735946]

A correlation was reported between the cognitive style of field dependence and the type of visual presentation format used in a computer-based tutorial when college students (n=204) identified human tissue samples. Subjects receiving a color visual presentation scored significantly higher.

lsy, cbi (PS)

Myhre, Oddmund Reidar. (1997). ***Technology pedagogy: Six teacher candidates' developing pedagogical models for the use of computers in science instruction*** (University Of Washington). DAI-A 58(06), p. 0001, 1997. [AAT9736339]

As six pre-service secondary science teachers explored more student-centered approaches to teaching, they found less room for technology in their future practice. Data indicated that the technology course work was isolated from the rest of the teacher education program and many misconceptions were left unchallenged.

ped, edt, tpd (TE, SE)

Neiswonger, Heather Faye Alice. (1997). ***A student-centered botany course for high school students*** (Michigan State University). MAI 36(04), p. 0893, 1998. [AAT1388560]

A revised botany course with greater student involvement was developed. Laboratory activities and discussions were based on student ideas. Analysis indicated an increase in student learning.

cur, bio, ped (HS)

Nevala, Amy Elizabeth. (1997). ***An evaluation of educators' participation in the Great Lakes Education Program*** (Michigan State University). MAI 36(04), p. 0893, 1998. [AAT1388563]

The focus of this research was to gain evaluative information from fourth grade teachers and local volunteers participating with the Great Lakes Education Program. Surveys were administered to 106 teachers and 40 volunteers.

ene, asm (TE, EL)

Newsom, Mary Carolyn. (1997). ***Concept application: Beyond assessment. The impact of culminating demonstrations on student learning*** (Texas Woman's University). MAI 35(05), p. 1132, 1997. [AAT1384850]

This study examined the effect of a culminating demonstration on the learning of third grade students. The culminating demonstration was a fair planned by students. Students were assessed to determine the impact of the demonstration.

asm, ats, cpl (EL)

Ngongbo, Lucie Ngwidibah. (1997). ***The effects of an environmental/science-technology-societal issues curriculum on preservice teachers*** (Southern Illinois University at Carbondale). DAI-A 58(08), p. 0001, 1998. [AAT9804046]

An STS issues program could improve preservice teachers' (n=138) environmental literacy and their perceptions and attitudes towards STS issues and teaching STS issues to elementary students. Preservice teachers could benefit from a program that uses the STS issues model.

sts, att, tpd, ene, cur (TE)

Nicdao-Quita, Maria Isabel T. (1997). ***Exploratory case study of students' main explanatory approaches to science concepts and their states of mental engagement*** (University of Illinois at Urbana-Champaign). DAI-A 58(06), p. 0001, 1997. [AAT9737207]

This study explored four Filipino students' dominant ways of operating in science; in other words, the types of structuring that was evident, not in terms of ideas, but in terms of how the students thought about, imagined, and related to physical processes. Affective structures played a significant role in the exploration of science concepts.

kns, bfs, nas (SE, PS)

Nodurft, Susan Jennings Johnson. (1997). ***The impact of an outdoor wilderness program on the participants' sense of connectedness to the natural world*** (The University of Southern Mississippi). DAI-A 59(02), p. 0001, 1998. [AAT9823909]

Key elements were identified that facilitated connectedness to the natural world. Childhood experiences played a significant role. Transformative programs, such as the outdoor program, need to be taken seriously and efforts should be made to incorporate these types of programs in our public schools.

fsd, ats, bkg (PS)

Noyes, Deanna Lee Kuiper. (1997). ***The effect of a short-term intervention program on the development of spatial ability in middle school*** (The University of Southern Mississippi). DAI-A 58(09), p. 3464, 1998. [AAT9809155]

Results indicated significant increases in spatial ability after seven weeks of lessons which focused on developing the ability to perceive, manipulate, and record spatial information. Also, spatial ability correlated with initial spatial ability and science achievement and was not associated with gender or age.

ach, sks (MS)

Nyhof-Young, Joyce Marion. (1997). ***Action research in gender issues in science education: Towards an understanding of group work with science teachers*** (University of Toronto). DAI-A 59(06), p. 1892, 1998. [AATNQ28029]

This case study investigated the nature of support and learning opportunities that an action research group provided for science teachers engaged in curriculum and professional development in the realm of gender issues in science education.

tpd, gen, res (TE)

O'Connor, Eileen Ann. (1997). ***Students' use of atomic and molecular models in learning chemistry*** (State University of New York at Albany). DAI-A 58(07), p. 2590, 1998. [AAT9802420]

Despite extensive exposure to atomic models in lectures, in the textbook, and in computer activities, students did not apply models appropriately, but rather used a simple Bohr model which had not been used in the course. Results suggest that more attention be given to models' selection, use, integration, and limitations.

che, rem (PS)

O'Connor, Teresa M. (1997). ***Creating effective environmental education: A case study utilizing an integrative teaching methodology to develop positive environmental attitudes and behaviors in the secondary general science curriculum*** (Temple University). DAI-A 58(03), p. 0806, 1997. [AAT9724264]

This study presents an in-depth case study of the development, the actual implementation, and subsequent evaluation of an environmental curriculum, and gives an in-depth view of life in this class of sixty-one sessions over a fourteen week period in a ninth grade general science class of twenty-four students.

ene, cur, ped, ats (HS)

Ojala, Jorma. (1997). ***Textual and visual representations of planetary phenomena in textbooks for comprehensive and senior secondary school use*** (Jyvaskylan Yliopisto). DAI-C 59(04), p. 0823, 1998. [Not Available from UMI]

Senior secondary-level earth and space science textbooks contained errors and did not explain everyday concepts or promote conceptual change.

mat, esg (SE)

Oluka, Silas Omoding. (1997). ***Towards ecoscience: Environmental and sociocultural perspectives in science. Some insights from Uganda, and implications for higher education*** (University of Alberta). DAI-A 58(09), p. 3465, 1998. [AATNQ21616]

To illuminate science and technology at the university and school system level, this study recommends a framework of science and science education which could foster closer alliances with indigenous knowledge, the needs of the majorities, including women, and sensitivity to ecological balance.

nas, eth, phe, cur, ref (ALL)

Omami, Catherine Najet. (1997). ***Optimum time to use instructional videos in the science classroom*** (Texas Woman's University). MAI 36(03), p. 0675, 1998. [AAT1388062]

This study was conducted to determine the most effective point in a teaching sequence for videos to be shown in order to have the greatest positive impact on student learning in a fourth grade science classroom. There was no significant difference in learning between the group being shown the video at the beginning of the topic and the group shown the video at the end of the topic.

ped, edt, lrg (EL)

Orcutt, Joan Catherine Brady. (1997). ***A case study on inquiry-based science education and students' feelings of success*** (San Jose State University). MAI 36(01), p. 0033, 1998. [AAT1386220]

Study addressed the advantages of an inquiry-based science environment in an eighth grade science class. Students at all aptitude levels were able to demonstrate learning in an inquiry-based environment and feel successful in their learning.

inq, ats, ach, kns, chs, ped (MS)

Osberg, Kimberley Marie. (1997). ***Constructivism in practice: The case for meaning-making in the virtual world*** (University of Washington). DAI-A 58(06), p. 2058, 1997. [AAT9736351]

This study of 7th and 8th grade students (n=117) compared the educational value of constructivist pedagogy as applied through the design, development and experience of 3-D interactive virtual learning environments to a traditional classroom approach and to a control.

cns, edt, ped, ene (MS)

Oursland, Mark David. (1997). ***Comparing the cognitive differences resulting from modeling instruction: Using computer microworld and physical object instruction to model real world problems*** (Montana State University). DAI-A 58(02), p. 0377, 1997. [AAT9721559]

The conclusions of this study imply that knowledge of the properties of squares improved the students' ability to model a geometric problem more than instruction in data analysis modeling. The use of computer microworlds in conjunction with cooperative groups is a viable method of modeling instruction.

rem, cbi, cpl (SE, PS)

Owens, Katharine Donner. (1997). ***The effect of instruction by a professional scientist on the acquisition of integrated process skills and the science-related attitudes*** (The University of Southern Mississippi). DAI-A 58(08), p. 3073, 1998. [AAT9806498]

This study suggested that students' acquisition of process skills and their science-related attitudes may be enhanced when instruction in problem-solving by a professional scientist takes place in the classroom.

sks, pbs, ntw, ats (MS)

Page, Scott Matthew. (1997). ***A case study of an outdoor environmental learning center at an elementary school*** (Indiana University). DAI-A 58(08), p. 3073, 1998. [AAT9805395]

A circular model emerged from the data in which values education, thematic teaching, and constructivism were intertwined within environmental education. Students' cognitive and affective domains were positively affected. Recommendations for developing and maintaining an outdoor environmental learning center are outlined.

ene, fsd, ats, lrg, tpd, cns (TE, EL)

Palacio-Cayetano, Joycelin. (1997). ***Problem-solving skills in high school biology: The effectiveness of the IMMEX problem-solving assessment software*** (University of Southern California). DAI-A 58(05), p. 1670, 1997. [AAT9733115]

A problem-solving authoring, learning, and assessment software, the UCLA IMMEX Program (Interactive Multimedia Exercises) was investigated in a twenty-week quasi-experimental study. Evidence was found that IMMEX software is highly efficient in evaluating salient elements of problem-solving.

pbs, edt, bio (HS)

Park, Hee-Joo. (1997). ***Anti-creationism in America*** (University of Melbourne). DAI-A 58(12), p. 4783, 1998. [AAT9818641]

The political reluctance of large scientific bodies to suppress creationism, coupled with their general apathy towards the issue, has reduced the impact of anti-creationism and has ultimately contributed to the continuous thriving of creationism.

evo, his (GEN)

Parker, Dawn Renee. (1997). ***Collaborative models for preservice elementary science preparation at colleges and universities in Texas*** (Texas A&M University). DAI-A 58(07), p. 2608, 1998. [AAT9800792]

Commitment to a common vision, recognition of the expertise of partners, and the ability of universities to institutionalize program changes were important for collaborative efforts in preservice elementary science preparation. However, the guidelines of science content courses and continuous growth were met inconsistently at the institutions in the study.

tpd, ntw (TE, EL)

Parker, Tehri Davenport. (1997). ***Integrating hypermedia into the environmental education setting: Developing a program and evaluating its effect*** (University of Minnesota). DAI-A 58(03), p. 0834, 1997. [AAT9724181]

A hypermedia program was as effective as the teacher/naturalist for teaching about environmental education material. The majority of students had positive attitudes toward the inclusion of computers in the camp setting, and felt that they were a good way to learn about environmental education topics.

ene, edt, kns, ats (ALL)

Parsons, Barbara Joy. (1997). ***Early adolescents' attitudes toward school science*** (The University of Western Ontario). MAI 36(06), p. 1452, 1998. [AATMQ28634]

Interviews with adolescents (n=6) between 12 and 14 years old found an overall dissatisfaction with school science. STS education is presented as having potential to maximize achievement and interest in science and minimize any gender gap in attitudes toward science.

ats, sts, gen, ref (MS)

Parziale, Jim. (1997). ***Microdevelopment during an activity-based science lesson*** (Harvard University). DAI-B 58(05), p. 2723, 1997. [AAT9734579]

Pairs of students were observed constructing marshmallow and toothpick bridges. A system of analysis was developed and used to detect the construction of new understandings. Patterns were used to infer three means of self-construction: shifts of focus, bridging mechanisms and distributed cognition.

cns, cid, kns (MS)

Patron, Francis. (1997). ***Conceptual understanding of thermodynamics: A study of undergraduate and graduate students*** (Purdue University). DAI-A 58(09), p. 3465, 1998. [AAT9808501]

Many students had difficulty connecting mathematical symbols to physical concepts. They did not understand the concept of equilibrium and never mentioned it in their descriptions of thermodynamics. Graduate students had many of the same difficulties and misconceptions as undergraduate students.

alf, kns, che (PS)

Pearce, Renee Deanna. (1997). ***Gender and physics: The relationship between learning orientation, self-confidence, and achievement*** (Memorial University of Newfoundland). MAI 36(02), p. 0316, 1998. [AATMQ23167]

This study explored the relationship between gender, learning orientation, self-confidence and achievement in high school physics students (n=131). Results indicated that more differences in achievement were accounted for by learning orientation and self-confidence than by gender.

lsy, gen, ach, ats, phy (HS)

Pearson, Robert Wayne. (1997). ***The effectiveness of the 1996 Wood Magic Science Fair as an experiential field trip*** (Mississippi State University). DAI-A 58(12), p. 4562, 1998. [AAT9818698]

Two tests were developed to evaluate the effectiveness of the 1996 Wood Magic Science Fair at Mississippi State University's Forest and Wildlife Research Center/Forest Products Laboratory. One test was designed for third-grade students and the other designed for fourth-grade students.

asm, nfd (EL)

Pensak, Karl John. (1997). ***Factors affecting science reform: Bridging the gap between reform initiatives and teaching practices*** (The University of Memphis). DAI-A 58(04), p. 1239, 1997. [AAT9730645]

This study identified 47 factors that may encourage or inhibit science curriculum reform. Staff development, training and support, laboratory facilities and materials, motivation and 'ownership,' collaboration, college preparation, textbook reform, community support and reform initiatives are major factors having a substantial effect on the adoption, implementation, and institutionalization of reforms.

ref, tpd, mat, bft, lab (K-12)

Polman, Joseph Louis. (1997). ***Guiding science expeditions: The design of a learning environment for project-based science*** (Northwestern University). DAI-A 58(04), p. 1193, 1997. [AAT9731316]

This study reports on how time constrains student and teacher action, how the traditional school culture and grading create stumbling blocks for change, how conflicting beliefs about teaching and learning undermine the accomplishment of guided inquiry and how the teacher guides students through mutually transformative communication.

inq, ref, ped, bft (HS)

Poole, Barbara Ann Matherly. (1997). ***An exploration of the perceptions, developmental reasoning levels, differences in learning processes, and academic achievement levels of students in introductory college microbiology*** (The University of Southern Mississippi). DAI-A 58(08), p. 3073, 1998. [AAT9806502]

This study explored the relationship between the grades students earned in introductory college microbiology and American College Testing scores, sex, race, age, GED or high school diploma, full-time or part-time student status, developmental reasoning levels, memory tactics, and expected achievement.

ach, bkg, bio, kns, bfs (PS)

Preston, George L. (1997). ***Evaluations of selected text references to natural selection by high school biology teachers*** (State University of New York at Albany). DAI-A 58(05), p. 1648, 1997. [AAT9733829]

This study investigated how twenty-four high school biology teachers evaluated potentially useful text containing canonical, anthropomorphic and teleological formulations that purport to explain biological adaptation through natural selection.

evo, mat (HS)

Pride, Tara Ellen O'Brien. (1997). ***An investigation of student difficulties with two dimensions, two-body systems, and relativity in introductory mechanics*** (University of Washington). DAI-A 58(08), p. 3072, 1998. [AAT9807011]

This four-year study identified conceptual and reasoning difficulties through individual demonstration interviews and descriptive studies that were conducted throughout the period of instruction. Findings were used to guide the design and modification of a tutorial curriculum to address specific student difficulties.

alf, phy, cur, ccg (PS)

Priestley, William Joseph. (1997). ***The impact of longer term intervention on reforming physical science teachers' approaches to laboratory instruction: Seeking a more effective role for the laboratory in science instruction*** (Temple University). DAI-A 58(03), p. 0806, 1997. [AAT9724272]

This study showed that modeled, inquiry-oriented laboratory instruction coupled with longer term practice, support and follow-up is effective in preparing teachers to reform their instructional practices and restructure their courses to incorporate a more hands-on, inquiry-oriented approach to laboratory experiences.

lab, inq, tpd (TE)

Qin, Yi. (1997). ***An investigation of the effectiveness of the Vee heuristic for student pre-laboratory preparations in chemistry*** (The University of Iowa). DAI-A 58(05), p. 1648, 1997. [AAT9731862]

Results support the finding that the utilization of the heuristic Vee diagram as a pre-laboratory requirement can improve students' understanding and performance and provide a structure on which students can rely for the effective organization of background knowledge.

lab, kns, che, lrg (PS)

Rasmussen, Brian Daniel. (1997). ***The role of environmental education in river-based greenway projects*** (The University of Arizona). MAI 35(06), p. 1691, 1997. [AAT1385748]

This study investigated the role public environmental education plays in greenway projects today.

ene, nfd, his (GEN)

Renaud, Chantelle Antoinette. (1997). ***A use of computer-assisted instruction in rural science education*** (The University of Texas at Austin). DAI-A 58(07), p. 2590, 1998. [AAT9803003]

Results indicate that a computer-assisted tutorial program improved rural students' science achievement; however, the program did not improve rural students' science achievement as well as classroom instruction without the tutorial. More importantly, the program did improve achievement for low achieving students.

cbi, ach, bkg (MS)

Richardson, William James. (1997). ***Intergalactic Proportions*** (California State University, Dominguez Hills). MAI 35(04), p. 0940, 1997. [AAT1383846]

Forty high school students from a biology class tested the effectiveness of a computer assisted instruction (CAI) program, titled "Intergalactic Proportions." Student achievement was significantly higher after using the program. Student's enthusiasm toward the subject matter also increased.

cbi, ach, ats, bio (HS)

Ridgway, Carolyn Jane. (1997). ***Participants' perception of value of a professional development program*** (University of California, Berkeley). DAI-A 58(07), p. 2609, 1998. [AAT9803102]

This study examined the worth participants assigned to an exemplary, long term professional development program designed to improve their teaching of elementary science. The relationship of this assigned value to participants' professional histories and current circumstances is reported.

tpd, bft (TE, EL)

Robeck, Edward C. (1997). ***Teaching heroics: Identity and ethical imagery in science education*** (The University of British Columbia). DAI-A 58(06), p. 2059, 1997. [AATNN19646]

To highlight the ideological elements of science in science education, another more explicitly symbolic system, epic heroism, was used as a comparative framework. This study focused on ideological elements associated with racism, sexism, and other social relationships that are referred to as relations involving divisive bias.

phe, mce, gen (GEN)

Robinson, Ronald Shane. (1997). ***Global positioning satellite technology in the secondary education physical science classroom*** (Eastern Michigan University). MAI 36(02), p. 0494, 1998. [AAT1387492]

Global Positioning Systems help achieve the goal of infusing education with a much needed technology. This study demonstrated how the use of GPS could enhance the secondary science curriculum.

edt, esg, ped, cur (SE)

Runge, Alan Paul. (1997). ***Impact of Maple on the design, instruction and performance in an undergraduate physics mathematical methods course*** (The University of Nebraska - Lincoln). DAI-A 58(06), p. 2144, 1997. [AAT9736950]

A physics course on mathematical methods incorporated a computer algebra program. Students reported positive and negative impacts. All of the students satisfactorily completed the course, and all continued to voluntarily use the program during the following semester.

edt, ats, phy (PS)

Rusbult, Craig Francis. (1997). ***A model of 'integrated scientific method' and its application for the analysis of instruction*** (The University of Wisconsin - Madison). DAI-A 58(05), p. 1568, 1997. [AAT9719267]

This research on integrated scientific method (ISM) looked at controversies about the nature of science and how to teach it, how instruction can expand opportunities for student experience, and how goal-oriented intentional learning might improve the learning, retention, and transfer of thinking skills.

nas, ped, lrg (SE)

Rymer, John Ewan. (1997). ***Discovering: Students' meanings for research*** (University of Alberta). DAI-A 58(09), p. 3465, 1998. [AATNQ21627]

Students responded to their research projects through their understanding of school social structures. The potential benefits desired in reformers' calls for authentic scientific practice may be subverted to a degree by students' acceptance of school social structures and their underlying discourse.

res, bfs, ref (HS)

Sandomir, Mark Richard. (1997). ***The use of metaphors as aids to and interferers of acquiring appropriate science conceptions*** (Arizona State University). DAI-A 58(03), p. 0806, 1997. [AAT9725334]

Students attributed high meaning to atomic structure-based metaphoric statements grounded in very little accurate information. Data revealed that assertions about the impact of metaphors on content learning and accurate conceptions are inappropriate and appear to be misconceptions about metaphoric language.

kns, lth, ccg (GEN)

Sartin, Kara Ann. (1997). ***Fourth-grade students' learning about work and energy through music*** (Texas Woman's University). MAI 36(03), p. 0667, 1998. [AAT1388069]

The purpose of this study was to integrate music into a hands-on work and energy science unit to reinforce the concepts being taught. The results did not support the instructional effectiveness of integrating music into this particular science unit.

int, hos, phy (EL)

Schanhals, Elizabeth Meyers. (1997). ***Using learning logs, laboratory exercises and the theme of agricultural science to teach basic environmental concepts*** (Michigan State University). MAI 36(01), p.0033, 1998. [AAT1386896]

Learning logs, laboratory exercises, and the theme of agricultural science were used in attempt to increase interest and understanding of the scientific principles behind environmental problems. Students showed significant improvement in comprehension of concepts. Entries in learning logs became starting points for discussions that moved the class away from being teacher oriented to one that was student oriented.

lrg, ped, ene, cid (HS)

Scheidemantel, Debora Diane. (1997). ***Behavioral and natural history studies of the jumping spider*** **Habronattus oregonensis** ***and inquiry based secondary laboratory lesson development stemming from university research*** (The University of Arizona). MAI 36(01), p. 0115, 1998. [AAT1386615]

Experiences from university research were used to develop lesson plans for biology classrooms at the secondary level. Lesson plans were developed around the behavior patterns of the jumping spider *Habronattus oregonensis*.

cur, bio, res (SE)

Schirripa, Santine Cuccio. (1997). ***The effects on interest, instruction, and achievement on the science question level of middle school students*** (University of South Florida). DAI-A 58(11), p. 4222, 1998. [AAT9815426]

The results of this study indicated that students who received instruction in researchable questioning outperformed those students who were not instructed on a measure of science question level.

sks, res, nas (MS)

Schramm, Susan Lynn. (1997). ***The quest for balanced curriculum: The perceptions of secondary students and teachers who experienced an integrated art and science curriculum*** (Miami University). DAI-A 58(08), p. 2966, 1998. [AAT9804349]

Oak Park students' (n=41) adaptability to an integrated art and science unit was found to be limited because of their inability to conceptualize curricular structures that were different from the traditional ones to which they were accustomed. Many students, especially high achieving students, were unwilling to experience course innovations and risk possible failure on standardized tests.

int, ref, cur, ats, bfs (HS)

Schuen, Dawn Marie. (1997). ***Comparison of high school science students' achievement in a 'traditional' classroom to students enrolled in an integrated curriculum course*** (Michigan State University). MAI 36(01), p. 0033, 1998. [AAT1386897]

Two groups of ninth-grade students, one group enrolled in a 'regular' science course and one group enrolled in an integrated program, did not demonstrate any significant differences in any objective or subjective assessments.

ach, int, cur (HS)

Senneca, Faye. (1997). ***Preservice elementary teachers' conceptions of science and science instruction during a methods course using the learning cycle*** (Temple University). DAI-A 58(10), p. 3895, 1998. [AAT9813545]

The learning cycle influenced preservice elementary teachers' conceptions of the nature of science and science instruction. By the end of the term, students had more complete understandings of the dynamic nature of science and the processes used to generate scientific knowledge. However, the ability to apply their newly learned instructional strategies was influenced by subject matter knowledge.

nas, lth, tpd, knt, ped (TE, EL)

Sentif, Margaret Kragnes. (1997). ***Implementation of staff development training funded by the D. D. Eisenhower mathematics and science education program in Mississippi school districts*** (The University of Southern Mississippi). DAI-A 58(09), p. 3478, 1998. [AAT9809159]

In this study of 114 teachers involved in training activities funded through a federal program, there was a significant relationship between training effectiveness, implementation, and the independent variables of training structure, administrative factors, incentives, and training components.

tpd, bft (TE, EL)

Sharman, Sandra Jeanne. (1997). ***The extent to which a model of motivated learning best predicts the academic performance of college students majoring in science*** (University of Georgia). DAI-A 58(12), p. 4602, 1998. [AAT9817834]

The results of this study suggest that the Corno and Mandinach (1983) model of motivated learning does not realistically represent the behavior of honors or traditionally placed college students majoring in biological science.

lth, chs, bio, ach, bfs (PS)

Shauman, Kimberlee Akin. (1997) ***The education of scientists: Gender differences during the early life course*** (The University of Michigan). DAI-A 58(10), p. 4078, 1998. [AAT9811191]

This research provides detailed and updated information about gender differences in the timing and causal mechanisms for entrance into and exit out of the science and engineering educational trajectory. The transition to college was the point where the educational paths of males and females diverged significantly. Expectations about future family roles had the greatest influence on the gender differences.

gen, bkg, car (PS)

Shea, John E. (1997). ***An integrated approach to engineering curricula improvement with multi-objective decision modeling and linear programming*** (Oregon State University). DAI-A 58(05), p. 1649, 1997. [AAT9734031]

A set of engineering competencies was developed from existing literature, and used in the development of a comprehensive mail survey of alumni, employers, students and faculty. Respondents proposed some changes to the topics in the curriculum and recommended that work to improve the curriculum be focused on communication, problem solving and interpersonal skills.

int, cur, ref, pbs, sks, tec (PS)

Shen, Ching-Heng. (1997). ***The effects of gender and cooperative learning with CAI on college students' computer science achievement and attitudes toward computers*** (Florida Institute of Technology). DAI-A 58(11), p. 4224, 1998. [AAT9814771]

Students who used CAI cooperatively had a significantly higher mean than those who used CAI individually. Neither gender nor interaction effects were found. Study suggested that instructors use cooperative learning strategies in CAI settings in computer courses, and CAI software be designed for group work.

gen, cpl, cbi (PS)

Shepherd, Lesa Hanlin. (1997). ***Predicting success on the advanced placement biology examination*** (The George Washington University). DAI-A 58(05), p. 1674, 1997. [AAT9731503]

The best combination of predictors of the Advanced Placement (AP) Biology Examination was found to be attendance, SAT verbal score, and SAT mathematics score (n= 460 high school students). These predictors can be used to assist in the prediction of scores, the identification of students in need of extra assistance, and the development of strategies to improve the AP Biology Program.

bio, ach (HS)

Sheppard, Keith. (1997). ***A qualitative study of high school students' pre- and post-instructional conceptions in acid-base chemistry*** (Columbia University Teachers College). DAI-A 58(05), p. 1649, 1997. [AAT9734093]

High school students (n=16) had considerable difficulty with the concepts of pH, neutralization, strength and the theoretical descriptions of acids and bases. Most students could not relate the concepts to actual solutions and were unable to describe acid-base phenomena at a sub-microscopic level. Students revealed a number of alternative conceptions, which remained unchanged by instruction.

alf, ccg, che, kns, lrg (HS)

Shin, Ann Chen-An. (1997). ***Development of an environmental education module for Taiwan's secondary and high school-aged students*** (Columbia University Teachers College). DAI-A 58(03), p. 0810, 1997. [Not Available from UMI]

The purpose of this project was to develop and pretest an environmental education module that could serve to further the development of environmental education for Taiwanese students in grades 7-11. Experts were interviewed by the researcher and their comments were incorporated in a final revision of the environmental module.

ene, cur (SE)

Shin, Donghee Sheen. (1997). ***Environmental earth science course development for preservice secondary school science teachers in the Republic of Korea*** (Columbia University Teachers College). DAI-A 58(09), p. 3465, 1998. [AAT9810970]

Korean faculty members (n=47) considered the topics of 'Waste Disposal' and 'Fresh Water Resources and Pollution' as the most important to be included for prospective teachers. Other urgent environmental problems such as soil pollution by pesticides, air pollution caused by hydrocarbon fuels, landslides, flooding, typhoon, and droughts were also considered important.

tpd, ene, cur, bft, sts (TE)

Sivalingam-Nethi, Vanaja. (1997). ***Examining claims made for performance assessments using a high school science context*** (Cornell University). DAI-A 57(11), p. 4708, 1997. [AAT9714915]

This study found no evidence of the positive effects of performance assessments on student attitudes towards science, in terms of a greater interest in science, enhanced self-perceived ability in science, higher motivation to pursue additional courses or careers in science, or a more positive perception of the meaningfulness of science.

asm, ats, bfs, car, nas (HS)

Spachuk, Lynn Marie. (1997). ***The effectiveness of action plans in the implementation of environmental education*** (University of Houston-Clear Lake). MAI 36(01), p. 0020, 1998. [AAT1386493]

The purpose of this study was to determine if written action plans at the end of a teacher training institute affect the quantity of environmental education activities implemented in the classroom. Evidence indicated that a written action plan helped teachers to eliminate barriers, implement school-wide projects, and develop relationships with their peers, school district, and the community.

ene, tpd, att (TE)

Spiegel, Samuel A. (1997). ***Understanding science teacher enhancement programs: Essential components and a model*** (The Florida State University). DAI-A 58(10), p. 3895, 1998. [AAT9813699]

This study analyzed a successful 3-year teacher enhancement program, identified essential components of an effective teacher enhancement program; and proposed a model to identify and articulate the critical issues in designing, implementing, and evaluating teacher enhancement programs.

tpd (TE)

Stansbury, Sydney Lynn. (1997). ***The effect of parental education, prior achievement, self-efficacy, goal orientation, and effort on undergraduate science performance of Latinos and Caucasians*** (University of Southern California). DAI-A 59(05), p. 1461, 1998. [AAT9835180]

Based on results from this study, the following interventions are recommended to increase undergraduate science performance: assessment in realistic self-appraisal of science skills; instruction in elaboration and organization strategies; and encouragement of intrinsic interest in science.

eth, lsy, bkg, sks, ach (PS)

Stromdahl, Helge Ronnie. (1997). ***On mole and amount of substance: A study of the dynamics of concept formation and concept attainment*** (Goteborgs Universitet). DAI-C 59(03), p. 0484, 1998. [Not Available from UMI]

Teachers' lack of understanding of the mole concept is used to argue that concepts are theory-laden and can only be attained within the theories to which they belong.

phe, lth, ccg, che (GEN)

Surbrook, Nancy Anne. (1997). ***Children's exposure to the natural environment and their environmental attitudes: An exploratory study*** (Michigan State University). MAI 36(01), p. 0021, 1998. [AAT1386904]

This study examined the relationship of children's exposure to the natural environment and their environmental attitudes at ages 4, 7, and 10. The results indicated that environmental attitudes vary at different age levels.

ene, ats, fsd (EL)

Sutherland, Erin Combs. (1997). ***A study of applying conceptual change research to the secondary physics classroom in the area of mechanics*** (Peabody College for Teachers of Vanderbilt University). DAI-A 58(12), p. 4606, 1998. [AAT9817288]

Overall, students (n=37) being taught using conceptual change instructional strategies showed progress in their test performance, although there was no statistically significant difference over the students (n=38) receiving traditional instruction. Speculations and recommendations about the use of conceptual change teaching techniques with secondary physics students are given.

ped, phy, ccg (SE)

Swan, Ralph E. (1997). ***A potential impact of computer technology on students' alternative conceptions and explanatory style*** (University of Pennsylvania). DAI-A 58(07), p. 2591, 1998. [AAT9800931]

The effective utilization of the software "Sir Isaac Newton's Games" improved fifth- and sixth-grade students' conceptualization of friction and gravity and prevented drops toward a less optimistic explanatory style as measured by Crandall's Intellectual Achievement Scale. Qualitative analysis suggested that some students may change conceptions greatly in a relatively short period of time.

alf, cbi, ccg, ach, phy (MS)

Sweeney, Aldrin Edward. (1997). ***Minority students in the science classroom: Issues of language, class, race, culture and pedagogy*** (The Florida State University). DAI-A 58(03), p. 0806, 1997 [AAT9725018]

This study explored the beliefs, pedagogical practices and problems of science teachers as they related to minority students, especially those minority students for whom English is not a first language and who have limited English proficiency. Culturally derived usages of non-standard forms of English are subsumed within this definition of minority students.

mce, cid, eth, ped, bkg (TE, K-12)

Talluto, Mark Anthony. (1997). ***Computer-based marine biology simulation*** (California State University, Dominguez Hills). MAI 35(04), p. 0940, 1997. [AAT1384195]

This research explored the use of computer aided instruction and the validity of a marine biology simulation for elementary school children (n=30). The analysis of pretest and posttest scores revealed that the students benefited from the computer-aided instruction. The affective evaluation determined that 86.7% of the students felt they knew more about marine biology after using "Under the Sea."

bio, cbi, ach, ats (EL)

Tejkl, Pamela M. (1997). ***Forensic unit: Application of science and math in the junior year*** (Michigan State University). MAI 36(01), p.0033, 1998. [AAT1386908]

Two units based on forensic science were created and tested. The thematic approach used included chemistry, biology, math, and technology topics.

cur, int, tec, che, bio (HS)

Thomas, Peter Lynn. (1997). ***Student conceptions of equilibrium and fundamental thermodynamic***

concepts in college physical chemistry (University of Northern Colorado). DAI-A 58(04), p. 1239, 1997. [AAT9729078]

Interviews with 16 students from three different institutions revealed twenty-nine different prevalent alternative conceptions and non-conceptions concerning equilibrium and fundamental thermodynamic concepts, including beliefs that endothermic reactions cannot be spontaneous, no heat can occur under isothermal conditions, and the entropy of the system must increase for a spontaneous change.

alf, che (PS)

Thurmond, Carolyn Koeval. (1997). ***Perceptions of scientific literacy among university science professors and science education professors*** (University of Miami). DAI-A 58(08), p. 3073, 1998. [AAT9805938]

Results indicate that science professors (n=16) emphasized science content when defining scientific literacy and preferred lectures, whereas science education professors (n=15) emphasized inquiry and student participation. Collaboration between science and education departments through seminars, workshops, co-teaching, and co-planning of courses is recommended.

bft, lit, ref, ntw (TE)

Tingley, Paula B. (1997). ***Attitude and achievement patterns of seventh grade science students: Are there sex differences?*** (University of Maine). DAI-A 58(08), p. 3074, 1998. [AAT9805031]

Results indicated no sex differences in science achievement at the sixth or seventh grade level. However, attitude was a stronger predictor of achievement for males than females. Males and females who were equal in science achievement may have different attributions for their successes and failures and these differences may have implication for future motivation to study science.

ach, ats, gen, car (MS)

Tonnis, Dorothy Ann. (1997). ***Integration of classroom science performance assessment tasks by participants of the Wisconsin Performance Assessment Development Project*** (The University of Wisconsin - Madison). DAI-A 59(01), p. 0076, 1998. [AAT9735856]

Science teachers demonstrated transformational thinking in their attitudes and beliefs about teaching and learning science and generally used well defined criteria to judge student work. Assessment and instructional practices were viewed as interdependent. Transformational teachers provided students with real-world assessment tasks as learning events.

asm, bft, ped, tpd (TE)

Tonso, Karen L. (1997). ***Constructing engineers through practice: Gendered features of learning and identity development*** (University of Colorado at Boulder). DAI-A 58(07), p. 2591, 1998. [AAT9800565]

High-status student engineers were the least likely to perform 'actual' engineering in design teams. Engineering education advanced an ideology that encouraged its practitioners to consider men's privilege and women's invisibility normal. Some teams of students at all levels carved out small oases where 'actual' engineering prevailed and women's participation was robust.

gen, tec (PS)

Troper, Jonathan Daniel. (1997). ***The effects of small-group discussion on students' learning and transfer of ideas in science*** (University of California, Los Angeles). DAI-A 58(12), p. 4558, 1998. [AAT9818146]

The largest influence on eighth grade students' (n=119) pre-post change was "constructive change power," defined as the product of the strength of constructive activity multiplied by the difference between the mental models used on the pretest and during group discussion. Higher level constructive activity occurred when mental models used by other students were more sophisticated.

cns, cid, cpl, lrg (MS)

Tucker, Linda Bart. (1997). ***Science at Hampton Normal and Agricultural Institute, 1868-1893*** (The Johns Hopkins University). DAI-A 58(04), p. 1224, 1997. [AAT9730802]

This historical study details the pragmatic, business purposes of Hampton's industries over any ideological agenda. Problems with providing specialized facilities, apparatus, and teachers made it difficult to provide rigorous, graded science instruction. The curriculum was designed for teacher training, using broad, elementary science topics for general knowledge and to train habits of mind.

his (GEN)

Varrella, Gary Frank. (1997). ***The relationship of science teachers' beliefs and practices*** (The University of Iowa). DAI-A 58(08), p. 2992, 1998. [AAT9805730]

Statistically significant factors contributing to teachers' practices included: the value placed on students as individuals whose ideas and contributions to the class are important; commitment to work as partners with students in the learning environment; commitment to making instruction relevant; commitment to life-long learning; and years of participation in state and national reform movements.

bft, ped, ref (TE)

Vasquez, David Alan. (1997). ***The effects of computer-game elements in physics instruction software for middle schools: A study of cognitive and affective gains*** (University of San Francisco). DAI-A 58(08), p. 3099, 1998. [AAT9806266]

This study utilized a selected set of game elements to contextualize and embellish physics word problems with the aim of making such problems more engaging. The primary conclusion drawn was that the ratio of 'story' to physics-learning content (3 minutes/45 minutes) was too small to make an educational difference and should be experimentally increased.

cbi, lrg, ats, phy (MS)

Veal, William Richard. (1997). ***The evolution of pedagogical content knowledge in chemistry and physics prospective secondary teachers*** (University of Georgia). DAI-A 58(08), p. 3074, 1998. [AAT9807136]

Knowledge of content and students formed a base from which prospective teachers developed domain-specific pedagogical content knowledge. Development of topic-specific pedagogical content knowledge occurred before domain-specific pedagogical content knowledge. Prospective teachers believed that classroom experience was integral to pedagogical content knowledge.

ped, tpd, knt, che, phy (HS)

Volz, Nikki Lyn. (1997). ***Shortchanging girls in science*** (Eastern Michigan University). MAI 36(01), p. 0033, 1998. [AAT1387045]

The Attitude Toward Science in School Assessment (ATSSA) was used to evaluate the relationship between such attitude and achievement in science. Overall, the gender differences were not significant.

gen, ats, ach (ALL)

Waker, Robert Lee. (1997). ***Scientific notation*** (California State University, Dominguez Hills). MAI 36(02), p. 0325, 1998. [AAT1387247]

The computer program "Scientific Notation" was developed to provide tutoring, drill and practice and assessment of students new to scientific notation. Results were statistically significant (n=27 students).

cbi, sks (SE)

Wallace, Stephen R. (1997). ***Structural equation model of the relationships among inquiry-based instruction, attitudes toward science, achievement in science, and gender*** (Northern Illinois University). DAI-A 58(08), p. 3074, 1998. [AAT9805201]

Results of this study indicate inquiry-based instruction was effective in positively influencing 7th- and 8th- grade students' understandings of science concepts. Additionally, inquiry-based instruction did not have an adverse influence on science achievement in 9th grade.

inq, ach, ats, gen (SE)

Walters, Nancy Bannister. (1997). ***Retaining aspiring scholars*** (University of Minnesota). DAI-A 58(07), p. 2566, 1998. [AAT9738494]

Tinto's retention model provided the theoretical framework for this research study of the academic and social integration of academically talented students of color into the graduate and professional science degree pipeline. Study findings indicated that supportive and empowering faculty contact was considered most important by students of color who continued on to graduate and professional programs.

eth, car, ntw (PS)

Walters, Wayne Robert. (1997). ***The relationship between teacher training and use of constructivist***

methodologies (University of California, Davis). DAI-A 59(06), p. 1917, 1998. [AAT9838568]

No difference in the amount of constructivist teaching methods being used in the classroom was found between teachers who had received extensive training and teachers who received little or no training in constructivist theory and methods. The school district's curricular and assessment expectations were found to be important in determining instructional methods.

cns, ped, tpd, cur, asm (TE)

Wang, Mei. (1997). ***Profile of laboratory instruction in secondary school level chemistry and indication for reform*** (Temple University). DAI-A 58(06), p. 2144, 1997. [AAT9738010]

This study profiled the laboratory component of instruction in secondary school level chemistry. The Modified Revised Science Teachers Behaviors Inventory (MR-STBI) was used for analysis.

lab, che, cht, ref (SE)

Ward, Randall Joe. (1997). ***An investigative look at the experiences of students using the computer in science classrooms: A guide for development*** (Purdue University). DAI-A 58(12), p. 4626, 1998. [AAT9819058]

The study found that regardless of the intent of a computer program, individual students used the program in various ways in response to their educational needs.

cbi (SE)

Werner, Lynn. (1997). ***Effects of learning structure and summarization during computer-based instruction*** (Arizona State University). DAI-A 58(10), p. 3837, 1998. [AAT9812493]

This study investigated the effects of learning strategy and summarization within a computer-based chemistry and physics program. The effects of learning strategy and summarization on posttest and enroute performance, attitude, time-on-task, and interaction behaviors were examined. Results of this study have implications for the design of computer-based instruction and the use of this medium with cooperative learning strategies.

cbi, lrg, cpl, ats, che, phy (PS)

White, Michael R. (1997). ***Exploring the impact of an industrial volunteer/school science partnership on elementary teaching strategies and attitudes about future science study: A case study*** (Temple University). DAI-A 58(06), p. 2145, 1997. [AAT9738014]

This study explored the impact of industrial volunteer/school partnerships on elementary science teaching behaviors and students' attitudes about future science study. Elementary teachers' behaviors during science instruction were not influenced by the partnerships.

ntw, att, ats, hos, lab (EL)

Wilder, Melinda Scholl. (1997). ***Teachers' beliefs about scientific literacy and their implementation through curriculum change*** (The Ohio State University). DAI-A 58(01), p. 0126, 1997. [AAT9721175]

The two teachers studied had different beliefs about scientific literacy. Findings indicated that teacher involvement was important and teacher beliefs were critical to the successful implementation of curriculum reforms that meet state and national scientific literacy goals.

bft, lit, ref, cur (TE, HS)

Wilhelms-Hackman, Desiree Anne. (1997). ***A contemporary curriculum development model: A case study of the development and implementation of Alberta's senior high science programs*** (University of Alberta). MAI 36(01), p. 0021, 1998. [AATMQ21238]

This study illustrates the dynamics of large-scale, curriculum reform and provides guidance to jurisdictions facing change towards an STS perspective. The model portrays the interrelationships among programs of studies, resources, professional development and the consultation and communication process.

cur, sts, ref, ntw (HS)

Williams, Erin Beth. (1997). ***A comparison of personality characteristics of male and female engineering students*** (Indiana State University). DAI-A 58(04), p. 1201, 1997. [AAT9729012]

Differences between personality characteristics of female (n=72) and male (n=86) freshman engineering students were studied to ascertain whether personality characteristics of these students were different from those of general collegiate students of the same sex. Engineering students of both sexes were more similar than different in personality characteristics. There were greater personality differences between freshmen male engineering students and male college students than there were between freshmen female engineering students and female college students.

gen, chs, tec, car (PS)

Williams, Tammy Kay. (1997). ***Effects of an intensive middle school science experience on the attitude toward science, self-esteem, career goal orientation, and science achievement of eighth grade female students*** (The University of North Carolina at Greensboro). DAI-A 58(04), p. 1239, 1997. [AAT9730030]

This study investigated the effects of a year long intensive extracurricular middle school science experience program including activities such as camping, rock climbing, specimen collecting and hiking on self-esteem, career goal orientation, and attitude toward science of eighth grade female students. Quantitative and qualitative methods were used.

nfd, ats, gen, car, bfs (MS)

Wiltshire, Michael A. (1997). ***Integrating mathematics and science for below average ninth grade students*** (Columbia University Teachers College). DAI-A 58(05), p. 0001, 1997. [AAT9734098]

The purposes of this study were to develop an integrated mathematics and science course for below average ninth grade students and investigate the effect of this course on students' performance. Results suggested that the most effective approach to teaching mathematics and science for below average students may be an integrated curriculum and an 'experimental methodology.'

int, chs, lrg, cpl, inq (HS)

Windward, Rolfe. (1997). ***Curriculum as natural history: A life-history case study of an alternative science learning program*** (University of California, Los Angeles). DAI-A 58(06), p. 0001, 1997. [AAT9737348]

The aim of this study was to further understanding of the nexus between individual development and conceptions of science curriculum, with particular emphasis upon root metaphors. Participants of this life-history case study consisted of three female high school students, three male high school students, and their teacher.

cur, bfs, bft (HS)

Wiseman, D. Kim. (1997). ***Identification of multiple intelligences for high school students in theoretical and applied science courses*** (The University of Nebraska - Lincoln). DAI-A 58(04), p. 0001, 1997. [AAT9730283]

This study assessed the multiple intelligences of high school students enrolled in theoretical and applied science courses. Analysis of multiple intelligence profiles collected from this study found significant differences in logical/mathematical, bodily/kinesthetic and intrapersonal multiple intelligences of students in theoretical science courses compared to students in applied science courses.

lsy, lth, ats (HS)

Wizinowich, Janice Ingrid. (1997). ***Figures of speech, signs of knowing: Towards a semiotic view of science conceptualization*** (The University of Arizona). DAI-A 58(04), p. 0001, 1997. [AAT9729473]

This study investigated alternative avenues, such as the use of narrative, for science conceptualization.

ped, lrg (MS)

Wood, Barbara Bonsall. (1997). ***An evaluation of a professional development course for secondary school science teachers: Chesapeake watershed ecology*** (George Mason University). DAI-A 58(01), p. 0001, 1997. [AAT9719977]

This study evaluated a professional development course titled Chesapeake Watershed Ecology. The course was evaluated within the framework of Stake's Countenance Model, using an objectives-based approach liberally embedded with qualitative methods.

tpd, asm (TE)

Wu, Homer Chung-Hung. (1997). ***Evaluation of interpretation: Effectiveness of the interpretive exhibit centers in Taroko National Park, Taiwan*** (Stephen F. Austin State University). DAI-A 58(04), p. 0001, 1997. [AAT9729687]

Three interpretive exhibit centers at Taroko National Park (TNP) in Taiwan were evaluated.

nfd, asm (GEN)

Yamamoto, Karen Kina. (1997). ***Against all odds: Tales of survival and growth of the Foundational Approaches in Science Teaching project*** (Stanford University). DAI-A 57(12), p. 0001, 1997. [AAT9714204]

The study focused on the Foundational Approaches in Science Teaching (FAST) project, a long-term survivor of reform in science education. Data collection included document analysis, interviews, and observations.

his, ref, mat (GEN)

Yang, Faxian. (1997). ***Integrating technology education concepts into China's educational system*** (West Virginia University). DAI-A 58(02), p. 0001, 1997. [AAT9722187]

The purpose of the study was to develop a strategy for integrating technology education concepts into the Chinese mathematics and science curricula. The researcher identified the advantages, disadvantages, and major concepts of current technology education programs of selected countries. Concepts were identified that would be readily acceptable into the current Chinese educational system.

tec, int, cur, ref (GEN)

Yonts, Jane Allen. (1997). ***Perceptions of structured inquiry labs by sixth-grade students, their teacher, and the researcher*** (Georgia State University). DAI-A 58(08), p. 0001, 1998. [AAT9804402]

This qualitative study identified some key factors related to the roles of student participation and teacher facilitation in structured inquiry lab activities. Students, teachers, and researchers had a positive feeling about the use of structured inquiry lab activities.

inq, lab, ats, att (MS)

Young, Jerry Wayne. (1997). ***The effect of four instructional methods, gender, and time of testing on the achievement of sixth graders learning to interpret graphs*** (The University of Alabama). DAI-A 57(12), p. 0001, 1997. [AAT9714291]

The effects of four instructional methods (direct instruction, computer-aided instruction, video observation, and microcomputer-based lab activities) on sixth grade achievement was studied. Findings indicated that the direct instruction group and the microcomputer-based laboratory group displayed longer retention rates. Effects were not gender related.

ped, cbi, edt, ach, gen (EL, MS)

Yutakom, Naruemon. (1997). ***The congruence of perceptions and behaviors exhibited by twelve successful middle school teachers in implementing Science/Technology/Society/Constructivist practices in Iowa Scope, Sequence, and Coordination schools*** (The University of Iowa). DAI-A 58(05), p. 0001, 1997. [AAT9731896]

This study investigated middle school teachers' perceptions about teaching and their purported strategies for implementing Science/Technology/Society and Constructivist practices in Iowa Scope, Sequence, and Coordination (SS&C) schools, and the congruence between these teacher's perceptions and their actual behaviors. Multiple data collection methods were used.

sts, cns, bft, ped (MS)

Dissertations by Institution

This list consists of 128 institutions that produced research dissertations and theses in the area of science education for the year 1997.

Arizona State University
Dieck; Sandomir; Werner

Auburn University
Donald

Boston University
Century

California State University, Dominguez Hills
Lopez; Marco; Richardson; Talluto; Waker

California State University, Fullerton
Marien; McFate

The Catholic University of America
Krylova

Christopher Newport University
Kowitz

The Claremont Graduate University
Dinucci

Cleveland State University
Hurd

Columbia University Teachers College
Havasy; Morgan, P.; Sheppard; Shin, A.; Shin, D.; Wiltshire

Cornell University
Abrams; Sivalingam-Nethi

Eastern Michigan University
Goebbel; Robinson; Volz

Florida Atlantic University
Doby

Florida Institute of Technology
Hirst; Luckett; Shen

Florida International University
Miller, R.

The Florida State University
Abbas; Butler; Lewis; Mattson; Muire; Spiegel; Sweeney

George Mason University
Wood

The George Washington University
Shepherd

Georgia State University
Golley; Yonts

Goteborgs Universitet
Stromdahl

Harvard University
Crismond; Hoffman; Parziale

Indiana State University
Williams, E.

Indiana University
Blank; Ferreira; Gabel; Page

Iowa State University
Hsu, Y.; Lynch

The Johns Hopkins University
Tucker

Jyvaskylan Yliopisto
Ojala

Kansas State University
Escalada; Gruner; Hein; Lee, C.

Lehigh University
Krieger

The Louisiana State University
Killebrew

Massachusetts Institute of Technology
Brandes

Memorial University of Newfoundland
Harding; Pearce

Miami University
Schramm

Michigan State University
Deng; Howes; Krusenklaus; Lamb; Neiswonger; Nevala; Schanhals; Schuen; Surbrook; Tejkl

Mississippi State University
Pearson

Montana State University
Morgan, M.; Oursland

North Carolina State University
DeChant; Engelhardt; Lawrence, L.

Northern Illinois University
Wallace

Northwestern University
Gordin; Polman

The Ohio State University
Brownstein; Carter; Chien; Hariharan; Hsu, S.; Hsueh; Jones, L.; Kochheiser; Wilder

Oklahoma State University
Boedecker; Jobe; Jones, S.

Oregon State University
Jacek; Shea

Pacific Lutheran University
Creager; Miller, J.

Peabody College for Teachers of Vanderbilt University
Sutherland

The Pennsylvania State University
Bradford; Cho; Foster; Keefer; Koul; Minner

Prescott College
Gardner; Langmaid; Lemburg

Purdue University
Bryan; Chung, M.; Lee, P.; Mitchell; Patron; Ward

Queen's University at Kingston
Lipman

Rutgers The State University of New Jersey - New Brunswick
Lawrence, M.; Loh-Yeo

Saint Louis University
Brown; De Laney; Everage

Salve Regina University
Kosten

San Jose State University
Orcutt

Seattle University
Hays

Simon Fraser University
Chung, P.; D'Agincourt; Hau; Huong

Southern Illinois University at Carbondale
DeClue; McBeth; Ngongbo

Stanford University
Drori; Hamilton; Keating; Yamamoto

State University of New York at Albany
Hogan; O'Connor, E.; Preston

State University of New York at Buffalo
Kujawinski

Stephen F. Austin State University
Wu

Syracuse University
Anaam; Giuliano

Temple University
Aldrich; Bennett; O'Connor, T.; Priestley; Senneca; Wang; White

Texas A&M University
Parker, D.

Texas A&M University-Commerce
Bowers; Hoffmann

Texas Woman's University
Blaine; Cole; DeSpain; Gavin; Gonzalez; Johnson; Lavender; Lawlor-Lopez; Newsom; Omami; Sartin

Universite de Sherbrooke
Catallozzi

The University of Akron
MacGowan

The University of Alabama
Ford; Goldsmith; Horton; Love; Young

University of Alberta
MacDonald; Oluka; Rymer; Wilhelms-Hackman

The University of Arizona
Draper; Rasmussen; Scheidemantel; Wizinowich

The University of British Columbia
Hepburn; Robeck

University of Calgary
Munroe

University of California, Berkeley
Hsi; Ridgway

University of California, Davis
Walters, W.

University of California, Irvine
Minear

University of California, Los Angeles
Esterle; Harlan; Troper; Windward

University of California, Riverside
Allan; Longo

University of California, Santa Barbara
Harp; Jelinek

University of Central Florida
Lavigne

University of Colorado at Boulder
Tonso

The University of Connecticut
Bednarski

University of Delaware
George

University of Denver
Mooney

University of Georgia
Clark; Doster; Hill, G. D.; Sharman; Veal

University of Houston
Adams

University of Houston-Clear Lake
Spachuk

University of Illinois at Chicago
Filippelli

University of Illinois at Urbana-Champaign
Beck; Chin; Chinn; Conefrey; McGaughey; Nicdao-Quita

The University of Iowa
Al-Momani; Campbell; Craven; Dass; Dundis; Enger; Freedman; Henriques; Lieu; Logan; Manhart; Qin; Varrella; Yutakom

University of Kentucky
Hanley

University of Louisville
Cundiff; Gillespie

University of Lowell
Mueller

University of Maine
Kesselheim; Tingley

University of Maryland College Park
Alao; Huntley

University of Massachusetts
Kudukey

University of Melbourne
Park

The University of Memphis
Pensak

University of Miami
Thurmond

The University of Michigan
Barrett; Fife; Meyer; Shauman

University of Minnesota
Armstrong; Beilby; Blue; Parker, T.; Walters, N.

The University of Mississippi
Griffin, L.

The University of Nebraska - Lincoln
Adrian; Ahern; Crapenhoft-Gatewood; Runge; Wiseman

University of Nevada, Reno
Heron; Michel-Clark

University of New Orleans
Kuehne

The University of North Carolina at Chapel Hill
Louden

The University of North Carolina at Greensboro
Hildreth; Williams, T.

University of North Texas
Keller

University of Northern Colorado
Lee, S.; Thomas

University of Pennsylvania
Swan

University of Pittsburgh
Bunt; Glenn; Hill, G. P.; Kim; Myers

University of Pretoria
Dube; Gray

University of St. Thomas
Freund

University of San Francisco
Vasquez

University of South Africa
Kizito

University of South Carolina
Broadway

University of South Florida
Farrell; Schirripa

University of Southern California
Almazroa; Maslin; Palacio-Cayetano; Stansbury

The University of Southern Mississippi
Dallal; Nodurft; Noyes; Owens; Poole; Sentif

The University of Tennessee
Hazari; May

The University of Texas at Austin
Allen; Anderson; Renaud

University of Toronto
Hall; Nyhof-Young

The University of Utah
Hyde

University of Virginia
McCauley

University of Washington
Kraus; Myhre; Osberg; Pride

The University of Western Ontario
Parsons

The University of Wisconsin - Madison
Rusbult; Tonnis

University of Wyoming
Hitt

Wayne State University
Armstrong-Hall

West Virginia University
Curtis; Hemler; Yang

Widener University
Griffin, G.

Research Articles Published in 1997

Matthew J. Maurer, *The Ohio State University*
Samantha J. Romanello, *The Ohio State University*

This section lists 212 articles in science education research that were published in 1997. Each entry is coded (see Key to Codes) with one to three major codes (in bold type) and up to three minor codes, as well as the appropriate educational level in parentheses following each citation. As with many science-related areas of study, science education is becoming an interdisciplinary field. Many of the articles listed here are examples of research in science education, but appear in publications outside the traditional science education literature. Wherever possible, we have coded these articles to reflect their specific contributions to science educational research methods, techniques, and applications. A brief scan through the list of searched journals will demonstrate the increasing diversity of this literature. All entries are indexed by major codes at the end of the volume, and the list of searched journals (containing the number of articles from each) is included at the end of this chapter (see page 77).

Abd-El-Khalick, Fouad; BouJaoude, Saouma. (1997). **An exploratory study of the knowledge base for science teaching.** *Journal of Research in Science Teaching, 34*(7), 673-699.

Describes the knowledge base of a group of science teachers as related to the structure, function, and development of their disciplines and their understanding of the nature of science. Twenty teachers participated in this study and their knowledge base was found to be lacking in all respects.

knt, nas, alf, tpd (TE)

Adams, Paul E.; Krockover, Gerald H. (1997). **Concerns and perceptions of beginning secondary science and mathematics teachers.** *Science Education, 81*(1), 29-50.

Identifies concerns of beginning science and mathematics teachers about being a new teacher and their perceptions of the effectiveness of their preservice program in relation to their concerns.

att, bft, tpd, cht, knt (TE, SE)

Adams, Paul E.; Krockover, Gerald H. (1997). **Beginning science teacher cognition and its origins in the preservice secondary science teacher program.** *Journal of Research in Science Teaching, 34*(6), 633-653.

Identifies the major tenets of a preservice secondary education program, knowledge structures that beginning science teachers have constructed about the teaching and learning of science, and the correlation between them.

tpd, knt, bft, ped, lth (TE, SE)

Adedayo, Adebisi; Olawepo, J. A. (1997). **Integration of environmental education in social science curricula at the secondary school level in Nigeria: Problems and prospects.** *Environmental Education Research, 3*(1), 83-93.

Examines the existing elements in and the various approaches to the integrated curriculum development project in Nigeria. Analyzes the constraints and support systems which are likely to be helpful in environmental education at the secondary level. Suggests measures and guidelines that could enhance the process of curriculum integration.

int, ene, cur, sts (SE)

Albaugh, Patti R.; et al. (1997). **Using a CD-ROM encyclopedia: Interaction of teachers, middle school students, library media specialists, and the technology.** *Research in Middle Level Education Quarterly, 20*(3), 43-55.

Observed sixth grade students and their ways of gathering information for a science report from *Encarta 94*, a CD-ROM encyclopedia.

edt, sks, ats (MS)

Aldridge, Bill G.; et al. (1997). **Scope, sequence and coordination: Tracking the success of an innovative reform project.** *Science Teacher, 64*(1), 21-25.

Discusses the ninth-grade trial implementation of the Scope, Sequence, and Coordination (SS&C) project and compares this class with the non-SS&C class that preceded it. Reports that the project helped teachers create a more inquiry-oriented learning environment and helped students' performance.

ref, cur, inq, tpd, ach (SE)

Allen, Sue. (1997). **Using scientific inquiry activities in exhibit explanations.** *Science Education, 81*(6), 715-734.

Investigates the effect of seven different scientific inquiry activities on visitors' understanding of the science underlying an interactive exhibit. Findings indicate that the interpretation activity was the most effective in facilitating visitors' understanding and the prediction activity was the least effective.

inq, lrg, nfd (GEN)

Alsop, Steve; Watts, Mike. (1997). **Sources from a Somerset village: A model for informal learning about radiation and radioactivity.** *Science Education, 81*(6), 633-650.

Research on conceptual change emphasizes the importance of factors in the cognitive domain. This research argues that models of conceptual change learning should also encompass issues of affect, conation, and self-esteem. The use of these expressions is explained via four case studies on members of a rural village informally learning about radiation and radioactivity.

nfd, ccg, lth, bfs (AD)

Alters, Brian J. (1997). **Whose nature of science?** *Journal of Research in Science Teaching, 34*(1), 39-55.

Investigates whether basic tenets for the "nature of science" are also held by philosophers of science and explores possible related philosophical positions underpinning differences in responses. Reports that the philosophers expressed significant disagreements with the tenets and different philosophers varied on their views about the tenets.

nas, phe (GEN)

Anderson, Charles W.; et al. (1997). **Canonical and sociocultural approaches to research and reform in science education: The story of Juan and his group.** *Elementary School Journal, 97*(4), 359-383.

Compares approaches to defining functional scientific literacy and helping students achieve it. The canonical approach focuses on literate individuals' knowledge, skills, and habits of mind, and the sociocultural approach focuses on factors such as values, which affect participation in the community's activities.

lit, res, kns, sks, bfs (EL)

Anderson, Charles W.; Lee, Okhee. (1997). **Will students take advantage of opportunities for meaningful science learning?** *Phi Delta Kappan, 78*(9), 720-724.

Uses four case studies to illustrate differences in task engagement in 12 students in two "exemplary" sixth grade science classrooms. Not all students are likely to benefit from improvements in science programs that provide increased opportunities for meaningful learning.

lrg, chs, cur, bkg (MS)

Anderson, Ronald D. (1997). **The science methods course in the context of the total teacher education experience.** *Journal of Science Teacher Education, 8*(4), 269-282.

Makes a research-based case for a particular approach to science teacher education which makes the science methods course the centerpiece and foundation of the teacher education program.

res, tpd, ref (TE)

Armstrong, Christine. (1997). **Social metaphors and their implications for environmental education.** *Environmental Education Research, 3*(1), 29-42.

Focuses on cultural influences in environmental education. Examines some of the means of transmission of culture and ideology that a society adopts including metaphors, myths, and institutions. Establishes a close link between inequalities of social classes, ideology, and resource use.

bkg, eqt, phe, ene (K-12)

Atwood, Ronald K.; Atwood, Virginia A. (1997). **Effects of instruction on preservice elementary teachers' conceptions of the causes of night and day and the seasons.** *Journal of Science Teacher Education, 8*(1), 1-13.

Reports on preservice elementary teachers' knowledge of the reasons for day and night, and the change of seasons. Instructional techniques using models and hands-on activities were successful in promoting conceptual change.

alf, knt, ccg, tpd, hos (TE, EL)

Austin, Caroline A. (1997). **A survey of final-year undergraduate laboratory projects in biochemistry and related degrees in Great Britain.** *Biochemical Education, 25*(1), 12-14.

Analyzes undergraduate research projects in biochemistry and related subjects at British universities. Discusses the trend toward students doing less research as part of their undergraduate study. Reasons cited for this trend include increased student numbers and costs.

res, ped, his (PS)

Barak, Moshe; et al. (1997). **Using developmental supervision to improve science and technology instruction in Israel.** *Journal of Curriculum and Supervision, 12*(4), 367-382.

Discusses an Israeli study examining the professional development of physics, electronics, and mechanics teachers. Examines whether an externally developed school improvement model could customize the supervision process to meet the needs of each school system and academic discipline.

phy, tpd, ped, ref (TE, SE)

Barman, Charles R. (1997). **Students' views of scientists and science: Results from a national study.** *Science and Children, 35*(1), 18-23.

Describes results from a survey of elementary school students' perceptions of scientists, school science, and the application of science in daily life. Students drew scientists with various stereotypic features, and most were depicted as white males.

bfs, nas, gen, car (EL)

Beeth, Michael E.; Wagler, Mark. (1997). **The Heron Network: Changing the way students learn science.** *Electronic Journal of Science Education, 2*(2) [1997, December 1]. Retrieved September 9, 1998 from the World Wide Web. [http://unr.edu/homepage/jcannon/ejse/beethwagler.html]

This article presents an inquiry method of teaching that encourages students to solve authentic questions about science and math and to use technology to communicate their findings in the Heron Network, a group of web sites constructed by the participants.

edt, inq, ntw, pbs, ped (EL)

Bereiter, Carl; et al. (1997). **Postmodernism, knowledge building, and elementary science.** *Elementary School Journal, 97*(4), 329-340.

Argues that science may be presented as a continuing effort to improve existing knowledge. Analyzes a three month discourse by sixth graders, showing that the basic commitments enabling scientific progress can be realized in elementary schools.

cid, phe, lit, nas (EL)

Billington, H. L. (1997). **Poster presentations and peer assessment: Novel forms of evaluation and assessment.** *Journal of Biological Education, 31*(3), 218-220.

Science student assessors evaluated each other's work and ranked posters of major ecosystem processes in the same order as staff assessors. Students ranking highly in poster presentation tended to do poorly in their essay work and vice versa.

asm, sks, chs (SE)

Boyes, Edward; Stanisstreet, Martin. (1997). **Children's models of understanding of two major global environmental issues (ozone layer and greenhouse effect).** *Research in Science and Technological Education, 15*(1), 19-28.

Aims to quantify the models that 13- and 14 year-old students hold about the causes of the greenhouse effect and ozone layer depletion. Assesses the prevalence of those ideas which link the two phenomena.

kns, rem, sts, alf (MS)

Briscoe, Carol; Peters, Joseph. (1997). **Teacher collaboration across and within schools: Supporting individual change in elementary science teaching.** *Science Education, 81*(1), 51-65.

Explores how collaboration among teachers from several schools and with university researchers facilitates attempts to change practices. Analysis indicates that collaboration facilitates change by providing opportunities for teachers to learn new content and pedagogical knowledge, encouraging them to be risk-takers in implementing new ideas, and supports and sustains the processes of individual change.

ntw, tpd, ped, knt (TE, EL)

Brookhart, Susan M. (1997). **Effects of the classroom assessment environment on mathematics and science achievement.** *Journal of Educational Research, 90*(6), 323-330.

Data were obtained from the 1987-1991 Longitudinal Study of American Youth for this study of secondary students. Beyond the expected effects of gender, socioeconomic status, reading ability, and prior achievement, homework effects were found for mathematics achievement; and homework and assessment format effects were found for science achievement.

bkg, ach, asm, chs, ped (SE)

Brownlow, Sheila; Durham, Staci. (1997). **Sex differences in the use of science and technology in children's cartoons.** *Journal of Science Education and Technology, 6*(2), 103-110.

Examines whether children's television cartoons portray male and female characters using science and technology in a different manner. Findings indicate that most characters were male and were often depicted using science and technology, usually while being aggressive; however, female characters were depicted as pro-social and using science and technology for the greater good of others.

gen, nas, nfd, mat (GEN)

Bruce, Bertram C.; et al. (1997). **University science students as curriculum planners, teachers, and role models in elementary school.** *Journal of Research in Science Teaching, 34*(1), 69-88.

Examines experiences of university students in an outreach program designed to teach science and foster positive attitudes toward science in younger children. Reports positive responses from teachers and children.

ntw, ats, att (EL, PS)

Burkam, David T.; et al. (1997). **Gender and science learning early in high school: Subject matter and laboratory experiences.** *American Educational Research Journal, 34*(2), 297-331.

Data from the National Education Longitudinal Study of 1988 were used to identify factors related to gender differences in tenth grade science performance. Findings emphasize the importance of active classroom involvement as a way of promoting gender equity.

gen, eqt, ped, lab, ach (HS)

Campbell, Patricia B.; Sanders, Jo. (1997). **Uninformed but interested: Findings of a national survey on gender equity in preservice teacher education.** *Journal of Teacher Education, 48*(1), 69-75.

Reports a study of how instructors in methods classes in mathematics, science, and technology addressed issues of gender equity. Results indicated that the teacher educators were interested but uninformed.

tpd, gen, eqt (TE)

Cannon, John R. (1997). **The Constructivist Learning Environment Survey may help halt student exodus from college science courses.** *Journal of College Science Teaching, 27*(1), 67-71.

Reports on the use of a survey to assess college science classroom learning environments. Recommends that college science instructors carefully examine their instructional techniques in light of decreased enrollment in such courses.

bkg, ped, cns, ats (PS)

Carriere, Francois J.; Abouaf, Madeleine. (1997). **Passion research: A joint venture to interest high school students in chemistry.** *Journal of Chemical Education, 74*(1), 61-63.

Describes a joint venture between the Centre National de la Recherche Scientifique (CNRS) and the Department of Education in France that was created to allow students to do practical scientific work with the help of a CNRS researcher. Concludes that this increases students' interest in chemistry.

ntw, res, ats, che (HS)

Caseau, Dana; Norman, Katherine. (1997). **Special education teachers use Science-Technology-Society (STS) themes to teach science to students with learning disabilities.** *Journal of Science Teacher Education, 8*(1), 55-68.

Describes the perceptions of inservice special education teachers (n=16) who tried STS instruction with their students. Teachers reported an increase in student behavior, motivation, and critical thinking and an increase in teacher motivation to cover science.

sts, ats, att, tpd (TE)

Chavkin, Laura. (1997). **Readability and reading ease revisited: State-adopted science textbooks.** *Clearing House, 70*(3), 151-154.

Examines whether the reading levels of state-adopted science textbooks at the high school level are consistent with their intended reader levels. Finds that four of five chemistry textbooks had reading levels beyond high school, while biology textbooks fared better but not as well as the physics and physical science textbooks, which were on grade level for all but one analysis.

mat (HS)

Chen, Qin; Donin, Janet. (1997). **Discourse processing of first and second language biology texts: Effects of language proficiency and domain specific knowledge.** *Modern Language Journal, 81*(2), 209-227.

Investigates the effects of science students' domain specific knowledge and language proficiency on local lexical and syntactic processing and on semantic and higher conceptual processing of biology texts written in the students' first and second languages.

lrg, mce, mat, knt, bio (PS)

Chiam, David Ben; Zoller, Uri. (1997). **Examination type preferences of secondary school students and their teachers in the science disciplines.** *Instructional Science, 25*(5), 347-367.

A study of the Types of Preferred Examinations (TOPE) in secondary school science students was analyzed according to school type and gender. Findings show students prefer written, open book, unlimited time examinations while teachers, though aware of student preferences, continue to use traditional written, time limited examinations.

asm, ats, att (SE)

Chinn, Pauline; Iding, Marie K. (1997). **High school chemistry students' self concepts as writers and scientists.** *Teaching and Change, 4*(3), 227-244.

Surveys of predominantly Asian students in college preparatory chemistry classes examined their views of themselves as scientists and readers and writers of science material. Results indicated that gender was related to students' views of themselves as scientists and writers of science. Family and extracurricular science activities were powerful influences.

bfs, bkg, gen, che, car (PS)

Clifford, Brian R.; et al. (1997). **Children's memory and comprehension of two science programmes.** *Journal of Educational Media, 23*(1), 25-50.

Describes a study conducted in the United Kingdom that assessed recall and comprehension scores of elementary and secondary school children following the viewing of two prime time science television programs. Predictor variables including age, sex, linguistic fluency, prior television viewing, and reading habits were investigated.

lrg, edt, gen, bkg (K-12)

Cobern, William W. (1997). **Distinguishing science-related variations in the causal universal of college students' worldviews.** *Electronic Journal of Science Education, 1*(3) [1997, March 1]. Retrieved September 9, 1998 from the Word Wide Web. [http://unr.edu/homepage/jcannon/ejse/cobern.html]

This survey examines the relationship between science interest and variations in the causal universe within college students' worldviews. The results indicate that science interest correlates with a logico-structural worldview.

lth, ats (PS)

Crandall, G. Douglas. (1997). **Old wine into new bottles.** *Journal of College Science Teaching, 26*(6), 413-418.

Discusses how traditional lab exercises can be converted into investigative exercises. Describes an exercise on seed germination that has students design their own experiments based on their initial results. Involves students in the scientific process and allows them to experience the joys and disappointments of experimental work.

lab, inq (PS)

Dana, Thomas M.; et al. (1997). Theoretical bases for reform of science teacher education. *Elementary School Journal, 97*(4), 419-432.

Examines key influences on science teaching and teacher education since 1955. Suggests a new paradigm for elementary science teacher education. Presents a case for three theoretical constructs that can inform policy and programs in science teacher education: constructivism, reflection, and professional community.

phe, tpd, ref, cns, ntw (TE, EL)

Dickinson, Valerie L.; Burns, Judy; Hagen, Elaine R.; Locker, Kathryn M. (1997). **Becoming better primary science teachers: A description of our journey.** *Journal of Science Teacher Education, 8*(4), 295-311.

Presents case studies of the authors' experiences in attempting to improve their science teaching at the elementary level. Important factors in changing science teaching were identified as personally recognizing and committing to change; and receiving and providing support throughout the professional development.

att, ntw, tpd (TE, EL)

dos Santos, Arion de Castro Kurtz; et al. (1997). **Students modelling environmental issues.** *Journal of Computer Assisted Learning, 13*(1), 35-47.

Describes a Brazilian project that aimed to improve the standard of science education in primary public schools through computer assisted learning. A neural network to analyze secondary students' models of local environmental problems is presented.

cbi, rem (SE)

Durham, Mary Ellen. (1997). **Secondary science teachers' responses to student questions.** *Journal of Science Teacher Education, 8*(4), 257-267.

Reports that teachers (n=6) in secondary science classrooms dominated discourse in the role of questioner. Sixty-one student cognitive questions and twelve teacher responses were identified in the data. Eight of the twelve teacher responses appeared to restrict student participation and result in student silence.

cid, skt, ats (TE, SE)

Einsiedler, Wolfgang; Treinies, Gerhard. (1997). **Effects of teaching methods, class effects, and patterns of cognitive teacher pupil interactions in an experimental study in primary school classes.** *School Effectiveness and School Improvement, 8*(3), 327-353.

Compared two experimental teaching strategies (hierarchical knowledge structuring and semantic networking) with traditional worksheet approaches used in (German) fourth grade classes studying the mallard's adaptation to its environment. Findings showed no significant effect favoring the experimental approaches over the traditional method.

ped, lrg (EL)

Elam, Carol L.; et al. (1997). **Academic medicine concerns of basic science and clinical departments: Using the nominal group technique in preparation for strategic planning.** *Higher Education Management, 9*(1), 105-116.

A study investigated whether one medical school's basic science and clinical departments attached differential importance to academic missions of teaching, research, and clinical service.

cur, res, ped, att (PS)

Erinosho, Stella Y. (1997). **Scientific experiences as predictors of choice of science among female high school students in Nigeria.** *Research in Science and Technological Education, 15*(1), 85-90.

Ascertains the interplay between scientific experiences and participation in school science among girls in the first year of secondary school. Results indicate that girls in science tend to participate in activities which relate to biology and are academic.

gen, ats, bkg, bio (SE)

Erinosho, Stella Y. (1997). **The making of Nigerian women scientists and technologists.** *Journal of Career Development, 24*(1), 71-80.

Responses from 209 of 520 Nigerian women in science and technology professions and university departments found they typically attended single sex schools, had highly educated parents, had more fathers than mothers in scientific technical professions, received parental and spousal support, and were concerned about combining marriage and career.

gen, car, bkg (GEN)

Falk, John H. (1997). **Testing a museum exhibition design assumption: Effect of explicit labeling of exhibit clusters on visitor concept development.** *Science Education, 81*(6), 679-687.

Investigates a museum exhibition design assumption that visitors develop conceptual understanding of a science topic after utilizing a cluster of conceptually related exhibits which lack explicit concept labeling.

lrg, nfd (PS)

Finson, Kevin D.; Ormsbee, Christine K.; Jensen, Mary; Powers, Donald T. (1997). **Science in the mainstream: Retooling science activities.** *Journal of Science Teacher Education, 8*(3), 219-232.

Describes a project which teamed science teachers with special education teachers to retool science curricular materials for classrooms where inclusion is practiced. Teacher participants began to shift from non-user and self-concerns to student-benefit concerns, and they reported success in using the retooled activities in classrooms.

chs, cur, cpl, tpd (TE)

Fisher, Darrell; et al. (1997). **Laboratory environments and student outcomes in senior high school biology.** *American Biology Teacher, 59*(1), 214-219.

Describes an investigation of the associations between students' perceptions of laboratory environment and their attitudinal, cognitive, and practical performance outcomes. Assesses student outcomes in three distinct areas: (1) student attitudes; (2) achievement on a written examination; and (3) practical performance, specifically in the biology classroom.

lab, bfs, ach, ats, sks (HS)

Fisher, Darrell L.; Waldrip, Bruce G. (1997). **Assessing culturally sensitive factors in the learning environment of science classrooms.** *Research in Science Education, 27*(1), 41-49.

Describes the development and validation of the Cultural Learning Environment Questionnaire (CLEQ) which assesses eight scales of the culturally sensitive environments of secondary school students.

mce, bkg, asm (SE)

Fisher, Martin S. (1997). **The effect of humor on learning in a planetarium.** *Science Education, 81*(6), 703-713.

The effect of humor on retention of information was examined at the planetarium at Ohio's Center of Science and Industry (COSI) in Columbus, OH. Results showed that the visitors who saw a humorous show retained less of the instructional material and scored lower on the test than the visitors who saw a nonhumorous show.

nfd, lrg, ped (GEN)

Flannery, Maura C. (1997). **Models in biology.** *American Biology Teacher, 59*(1), 244-248.

Addresses the most popular models currently being chosen for biological research and the reasons behind those choices. Concludes with a brief examination of the ethical issues involved, and why some animals may need to be replaced in research with model systems.

rem, res, bio, phe, sts (SE, PS)

Flannery, Maura C. (1997). **Back to bacteria.** *American Biology Teacher, 59*(6), 370-373.

Explores new research about bacteria. Discusses bacterial genomes, archaea, unusual environments, evolution, pathogens, bacterial movement, biofilms, bacteria in the body, and a bacterial obsession.

res, bio (PS, SE)

Fleer, Marilyn. (1997). **A cross-cultural study of rural Australian Aboriginal children's understandings of night and day.** *Research in Science Education, 27*(1), 101-116.

Reports on a pilot study which sought to find out what four-to-eight year old rural Australian Aboriginal children think about night and day. Findings indicate more variations in thinking than were found in earlier research.

eth, alf, kns (EL)

Fouad, Nadya A.; Smith, Philip L.; Enochs, Larry. (1997). **Reliability and validity evidence for the middle school self-efficacy scale.** *Measurement and Evaluation in Counseling and Development, 30*(1), 17-31.

Provides validity evidence for a new instrument that assesses a career related self-efficacy intervention for Hispanic and Latino students. Focuses on the broad area of career decision making and on math and science tasks. Results indicate adequate validity of the instrument, particularly for women and minority students.

asm, car, eth, ats (MS)

Fouzder, Nani B. (1997). **The effect of modified input on the acquisition of vocabulary in science by a newly arrived bilingual student in a secondary school.** *Multicultural Teaching, 15*(3), 23-24.

Studies the effect of specific teacher input, modified for comprehension, on the acquisition of science vocabulary by a recent immigrant, a 12 year-old newly arrived at an English secondary school. Comprehensible input played an important part in the acquisition of this student's science vocabulary.

mce, cid, ped (MS)

Freedman, Michael P. (1997). **Relationship among laboratory instruction, attitude toward science, and achievement in science knowledge.** *Journal of Research in Science Teaching, 34*(4), 343-357.

Investigates the use of a hands-on laboratory program for improving student attitudes toward science and increasing student achievement levels in science knowledge. Findings indicated that students who had laboratory instruction scored higher in achievement and showed a positive correlation between attitude and achievement. No significant differences were obtained for the limited English proficiency groups.

hos, ats, ach, lab, ped, mce (K-12)

Gascoigne, Toss; Metcalfe, Jenni. (1997). **Incentives and impediments to scientists communicating through the media.** *Science Communication, 18*(3), 265-282.

A survey of Australian scientists revealed that they felt media coverage of their research had significant benefits, but they received little support from their organizations. Examines factors that encourage or discourage scientists to communicate their work through the media. Survey questions and the group monitor guide are appended.

ntw, nas, tec (GEN)

Gilbert, John; Priest, Mary. (1997). **Models and discourse: A primary school science class visit to a museum.** *Science Education, 81*(6), 749-762.

A critical incident approach was used to analyze the discourse which took place during a visit by a class of eight and nine-year-olds to a gallery concerned with food at the Science Museum in London. Data collection, analysis, and interpretation are discussed.

cid, nfd (EL)

Ginsberg, Edward S. (1997). **Survey of physics instructor attitudes on student access to problem solutions.** *Electronic Journal of Science Education, 2*(2) [1997, December 1]. Retrieved September 9, 1998 from the World Wide Web. [http://unr.edu/homepage/jcannon/ejse/ginsbergetal.html]

This study presents data from a survey of the attitudes of university physics instructors on allowing students access to textbook problem solutions. A detailed analysis of all survey responses is included, as well as implications for pedagogical strategies.

att, mat, ped, phy (PS)

Gossen, Eleanor; Kaczor, Sue. (1997). **Variation in interlibrary loan use by University at Albany science departments.** *Library Resources & Technical Services, 41*(1), 17-28.

Investigates interlibrary loan use patterns for scientists at SUNY (State University of New York)

Albany by analyzing one year's worth of filled interlibrary loan requests for journal articles. Highlights include differences among scientific disciplines; year of publication; and sources of citations.

mat (GEN)

Granados, Deanne R. Perez; Callanan, Maureen A. (1997). **Parents and siblings as early resources for young children's learning in Mexican descent families.** *Hispanic Journal of Behavioral Sciences, 19*(1), 3-33.

Interviews with parents from 50 Mexican descent families revealed that parents encouraged their preschool children to ask questions about science and causal relationships; older and younger siblings learned different skills from one another; and children learned through observation and imitation.

eth, bkg, sks, lrg (EC)

Greenfield, Teresa Arambula. (1997). **Gender- and grade-level differences in science interest and participation.** *Science Education, 81*(3), 259-275.

Explores students' attitudes towards science, prior science-related experiences, and perceptions of science and scientists and how they vary by gender and grade. Findings indicate that girls and boys expressed similar opinions on all survey scales but girls were less likely to view science as a male-stereotyped field.

gen, nas, ats, bkg, bfs, car (K-12)

Griffin, Janette; Symington, David. (1997). **Moving from task-orientated to learning-orientated strategies on school excursions to museums.** *Science Education, 81*(6), 763-779.

Although museums are considered optimal venues for informal learning, this study concludes that most school classes visiting museums are restricted and structured, teachers use mainly task-orientated teaching practices, and the museum activities are rarely linked to topics being studied at school.

nfd, lrg, ped (K-12)

Guruswamy, Chitra; et al. (1997). **Students' understanding of the transfer of charge between conductors.** *Physics Education, 32*(2), 91-96.

Investigates students' understanding of the transfer of charge between two charged conductors. Findings indicate that a considerable number of students from eighth grade to college in advanced physics courses were unable to predict the transfer of charge correctly from one conductor to another.

phy, kns, alf (SE, PS)

Guzzetti, Barbara J.; et al. (1997). **Influence of text structure on learning counterintuitive physics concepts.** *Journal of Research in Science Teaching, 34*(7), 701-719.

Explores the influences of text structure on students' conceptual change. Case studies were conducted and results showed that individuals used refutational text to change their alternative conceptions and acquire new concepts. Findings indicate that refutational text does cause cognitive conflict.

ccg, mat, phy (PS)

Haidar, Abdullateef. (1997). **Prospective chemistry teachers' conceptions of the conservation of matter and related concepts.** *Journal of Research in Science Teaching, 34*(2), 181-197.

Reports a study of the quality and extent of understanding of certain well-known theoretical concepts which are held by prospective teachers (n=173) of chemistry in Yemen. Results indicate that teacher understanding ranges from a partial understanding with a specific misconception to no understanding.

alf, knt, che, tpd (TE)

Haiqi, Zhang. (1997). **More authors, more institutions, and more funding sources: Hot papers in biology from 1991 to 1993.** *Journal of the American Society for Information Science, 48*(7), 662-669.

A bibliometric study analyzed the authorship of biology periodicals, "Nature," "Science," and "Cell" from 1991 to 1993. The source data consisted of "hot papers" in biology and a sample of articles from the three periodicals. Results showed that the hot papers have more authors and participating institutions, and that funding sources are related to the number of authors.

mat, bio, res (GEN)

Hall, Sue. (1997). **The problem with differentiation.** *School Science Review, 78*(284), 95-98.

Describes an attempt to introduce differentiation by task in an inner city secondary school. Concludes that differentiated work cards lead to no significant improvement in the achievement of lower ability students. High- and medium-ability students improved their performance as a result of using the work cards.

sks, ach, chs, ped (SE)

Hamilton, Laura S.; et al. (1997). **Interview procedures for validating science assessments.** *Applied Measurement in Education, 10*(2), 181-200.

The usefulness of small scale interview studies to explore the validity of science achievement tests in several formats was studied with 141 high school students and 49 fifth and sixth graders. Results, which provided evidence of test validity, also support the use of small scale qualitative interviews in test validation.

res, ach (K-12)

Hand, Brian; Treagust, David F.; Vance, Keith. (1997). **Student perceptions of the social constructivist classroom.** *Science Education, 81*(5), 561-575.

Examines student perceptions of the changing nature of a classroom as a result of the implementation of constructivist approaches. Results indicate that students are appreciative of the opportunity to use their own ideas and knowledge.

cns, ats, cid, ped (PS)

Harris, Charles L.; et al. (1997). **Integrated problem-based learning for first year medical students: Does it teach biochemical principles?** *Biochemical Education, 25*(3), 146-150.

Describes an integrated problem-based learning experience for first-year medical students and assesses the effectiveness of the process in identifying basic science issues relevant to biochemical principles.

pbs, int, ped, lrg (PS)

Hartlet, James; Greggs, Michael A. (1997). **Divergent thinking in arts and science students: "Contrary imaginations" at Keele revisited.** *Studies in Higher Education, 22*(1), 93-97.

A study replicated earlier research on divergent thinking and college major at Keele University (England), gaining weak support for the notion that arts students differ significantly from science students on measures of divergent thinking.

car, chs, lsy, kns (PS)

Harwood, William S.; McMahon, Maureen M. (1997). **Effects of integrated video media on student achievement and attitudes in high school chemistry.** *Journal of Research in Science Teaching, 34*(6), 617-631.

Explores the effects of an integrated video media curriculum enhancement on students' achievement and attitudes in a high school chemistry course. Findings reveal significantly higher achievement scores for students who experienced the course enhanced with integrated video media.

edt, ats, ach, che (HS)

Hatzinikita, Vassilia; Koulaidis, Vasilis. (1997). **Pupils' ideas on conservation during changes in the state of water.** *Research in Science and Technological Education, 15*(1), 53-70.

Explores both the qualitative and quantitative dimensions of pupils' ideas related to conservation during state changes of water. Analysis of questionnaire data indicates that qualitative understanding precedes quantitative.

kns, alf, phy (K-12)

Hayhurst, Anne-Marie; Campbell, Maddie; Howlett, Dennis. (1997). **Energy ideas in the nursery.** *Primary Science Review, 48*, 8-10.

Details the process and results of an action research project that explored children's understandings of why toys move in certain ways. The purpose of the project is to inform tutoring sessions and the classroom practices of student teachers.

kns, phy, tpd (EL, TE)

Hounshell, Paul B.; Madrazo, Gerry M., Jr. (1997). **The role expectancy of the science supervisor revisited.** *Science Educator, 6*(1), 33-35.

Reports on a study designed to assess the perceptions of principals, teachers, superintendents, science supervisors, and science education leaders (n=628) about the role of the science education expert. Findings indicate that the role of the science supervisor has emerged as a key element in the discussion of secondary science education.

ntw, bft, ref, tpd (EL, SE)

Howard, Robert E.; Boone, William J. (1997). **What influences students to enjoy introductory science laboratories?** *Journal of College Science Teaching, 26*(6), 383-387.

Investigates which factors are important in revising chemistry laboratory experiments to enhance student interest and enjoyment of experimental science. Findings indicate the importance of several factors including varied content, real-world connections, items from outside the student's usual range of experience, well-paced experiments, error-free procedures, easily mastered manipulations, social factors, and a positive atmosphere.

lab, ats, ped, che (PS)

Howe, Ann C.; Stubbs, Harriett S. (1997). **Empowering science teachers: A model for professional development.** *Journal of Science Teacher Education, 8*(3), 167-182.

Presents some results of the SCI-LINK teacher professional development program. The SCI-LINK summer institutes allows teachers to work with scientists to learn about current research and develop curricula for their classrooms. Teachers involved indicated increased self-confidence, development of new teaching ideas and practices, and development of previously unsuspected leadership abilities.

ntw, tpd, cur, res (TE)

Huffman, Douglas. (1997). **Effect of explicit problem solving instruction on high school students' problem-solving performance and conceptual understanding of physics.** *Journal of Research in Science Teaching, 34*(6), 551-570.

Investigates the effect of explicit problem-solving instruction on high school students' (n=145) conceptual understanding of physics. Findings indicate that the explicit strategy improved the quality and completeness of students' physics representations more than the textbook strategy.

pbs, ccg, phy, ped (SE)

Huinker, DeAnn; Madison, Sandra K. (1997). **Preparing efficacious elementary teachers in science and mathematics: The influence of methods courses.** *Journal of Science Teacher Education, 8*(2), 107-126.

Finds that the math and science personal teaching efficacy and outcome expectancy beliefs of preservice elementary teachers showed significant increases after participation in an integrated, hands-on methods course designed according to constructivist philosophy. Results were consistent over two semesters.

bft, tpd, hos, int, cns (TE, EL)

Hynd, Cynthia; et al. (1997). **Preservice elementary school teachers' conceptual change about projectile motion: Refutation text, demonstration, affective factors, and relevance.** *Science Education, 81*(1), 1-27.

Investigates changes in preservice teachers' conceptions about projectile motion brought about by a combination of reading and demonstration and appeal to usefulness. Results indicate the effectiveness of a combined Demo-Text condition on immediate posttests and effectiveness of text in producing long-term change.

ccg, tpd, knt, ped, mat (TE, EL)

Iding, Marie K. (1997). **Can questions facilitate learning from illustrated science texts?** *Reading Psychology, 18*(1), 1-29.

Examines the effectiveness of using questions to facilitate processing of diagrams in science texts. Finds that questions about illustrations do not facilitate learning.

mat, lrg (PS)

Ingvarson, Lawrence; Loughran, John. (1997). **Loose connections: The context of science teachers' work.** *Research in Science Education, 27*(1), 1-24.

Explores the problems that a national strategy for the professional development of science teachers attempted to address and reports on the theme of "loose connections" that emerged. Discusses implications for a national professional development strategy.

tpd, ref (TE)

Jackson, David F. (1997). **Case studies of microcomputer and interactive video simulations in middle school earth science teaching.** *Journal of Science Education and Technology, 6*(2), 127-141.

Synthesizes the results of three case studies of middle school classrooms in which computer and video materials were used to teach topics in earth and space sciences through interactive simulations.

edt, lrg, esg (MS)

Jackson, David F.; et al. (1997). **Internet resources for middle school science: Golden opportunity or "Silicon Snake Oil?"** *Journal of Science Education and Technology, 6*(1), 49-57.

Reports on a study that examines the experiences of six teachers at three schools in learning about and beginning to implement or enhance project-based learning in their middle school science classrooms using a variety of resources available on the Internet.

edt, ped, tpd (TE,MS)

James, Robert K.; et al. (1997). **Science Research.** *Science Scope; 20*(6), 63-66.

Describes the Agricultural Research Service Science Education Collaborative (ARSC), a project aimed at making the U.S. Department of Agriculture's research labs more accessible to the educational community and encouraging students to consider careers in science. Presents a case study of a teacher in the project and discusses the impacts of the partnership.

car, ntw, tpd, res (GEN)

Jetton, Tamara L.; Alexander, Patricia A. (1997). **Instructional importance: What teachers value and what students learn.** *Reading Research Quarterly, 32*(3), 290-308.

Examines contextual factors that influence what students deem interesting and important by examining what teachers signal as interesting/important in their classroom discussions and assessments. Reveals that the valuing system within three classrooms varied in noticeable ways.

bft, bfs, cid, bkg (HS)

Johanson, George A. (1997). **Differential item functioning in attitude assessment.** *Evaluation Practice, 18*(2), 127-135.

A discussion of differential item functioning (DIF) in the context of attitude assessment is followed by examples involving the detection of DIF on an attitudes toward science scale completed by 1,550 elementary school students and the finding of no DIF in a workshop evaluation completed by 1,682 adults.

ats, asm (AD, EL)

Johnson, Donald M.; Wardlow, George W.; Franklin, Timothy D. (1997). **Hands-on activities versus worksheets in reinforcing physical science principles: Effects on student achievement and attitude.** *Journal of Agricultural Education, 38*(3), 9-17.

A group of 132 agricultural science students were divided into an experimental group, who completed hands-on activities on Ohm's Law and incline plane, and a control group who completed worksheets. There were no significant differences in immediate or follow up measures of achievement.

hos, lrg (HS)

Johnstone, A. H.; et al. (1997). **How long is a chain? Reasoning in science.** *School Science Review, 78*(285), 73-77.

Analyzes the length of spontaneous reasoning chains exhibited by pupils in primary and early secondary schools. Findings indicate that the reasoning chain lengths may make it difficult for students to handle parts of the science curriculum that involve multi-step reasoning processes.

pbs, sks, lrg, cur (EL)

Jones, Leslie S. (1997). **Opening doors with informal science: Exposure and access for our underserved students.** *Science Education, 81*(6), 663-677.

The Young Scholars Program at The Ohio State University is a 6-year pre-collegiate intervention program designed to prepare academically talented, economically disadvantaged minority students for college education. This study describes the success of this effort to reshape the traditional presentation of agriculture.

eth, eqt, sks (SE, PS)

Kahn, Jeffrey, H.; Scott, Norman A. (1997). **Predictors of research productivity and science related career goals among counseling psychology doctoral students.** *Counseling Psychologist, 25*(1), 38-67.

Notes that few counseling psychologists publish research after obtaining their doctoral degree. Investigated predictors of research productivity and science related career goals in doctoral students (n=267) from 15 counseling psychology programs.

car, ats, res (PS)

Kamen, Michael; et al. (1997). **A multiple perspective analysis of the role of language in inquiry science learning: To build a tower.** *Electronic Journal of Science Education, 2*(1) [1997, September]. Retrieved September 9, 1998 from the World Wide Web. [http://unr.edu/homepage/jcannon/ejse/kamen_etal.html]

This paper analyzes a short discussion between several elementary students during a science activity. The interaction between language and science learning is discussed relative to different theoretical perspectives, in addition to classroom implications.

cid, lth, ped (EL)

Kassebaum, Donald G.; et al. (1997). **The objectives of medical education: Reflections in the accreditation-looking glass.** *Academic Medicine, 72*(7), 647-656.

A study using accreditation data, institutional self studies, and accreditation site visit reports on 59 medical schools explored the extent to which the schools have established institutional and departmental educational objectives.

cur, asm (PS)

Kelly, Gregory J.; Crawford, Teresa. (1997). **An ethnographic investigation of the discourse processes of school science.** *Science Education, 81*(5), 533-559.

Draws from studies in the sociology of scientific knowledge to create a new perspective for understanding school science. Merges ethnography and discourse analysis to study science-in-the-making in a physics classroom. Investigates local conceptual ecologies.

cid, phe, nas (EL)

Kirst, Michael W.; et al. (1997). **Politics of science education standards.** *Elementary School Journal, 97*(4), 315-328.

Specifies some of the conflicts in philosophies, values, and priorities regarding scientific knowledge present in the development of science education curriculum standards through the use of the "Science for All Americans project." Excerpts interviews to identify key issues.

cur, phe, ref, nas, lit (GEN)

Klein, Stephen P.; et al. (1997). **Gender and racial/ethnic differences on performance assessments in science.** *Educational Evaluation and Policy Analysis, 19*(2), 83-97.

Whether differences in mean scores among gender and racial/ethnic groups on science performance assessments are comparable to those for traditional tests was studied with 2,000 students in grades five, six, and nine. Overall, results suggest that the type of test has little effect on these differences in scores.

eth, gen, sks, asm, ach (MS, SE)

Korpan, Connie A.; et al. (1997). **What did you learn outside of school today? Using structured interviews to document home and community activities related to science and technology.** *Science Education, 81*(6), 651-662.

Children's activities related to science, nature, and technology were studied via structured interviews of parents and students in pre-school through upper-elementary grades. Describes how interviews were developed, what type of information was obtained, and lessons learned.

nfd, sts, lrg, res (EC, EL)

Korpan, Connie A.; et al. (1997). **Assessing literacy in science: Evaluation of scientific news briefs.** *Science Education, 81*(5), 515-532.

Examines the types of requests for information made by university students (n=60) as they evaluate scientific news briefs. Student requests most often focus on how research is conducted and why results might occur.

lit, mat, res, kns (PS)

Koul, Ravinda; Dana, Thomas M. (1997). **School science in India: Curriculum developers/textbook authors' perspectives.** *Electronic Journal of Science Education, 2*(2) [1997, December 1]. Retrieved September 9, 1998 from the World Wide Web. [http://unr.edu/homepage/jcannon/ejse/kouldana.html]

This report presents data from interviews with curriculum developers/textbook authors to offer insights into the gap between objectives of the National Policy on Education and the development of more meaningful and relevant school science materials.

cur, mat, ref (K-12)

Krakauer, Janet. (1997). **Roadkill Roundup.** *Science Scope, 20*(7), 13-15.

Describes the Fifth Grade Roadkill Study that was designed to make students aware of the types of animals, chiefly mammals, that live in the central piedmont area of North Carolina. Involves students taking a survey of roadkills.

res, ped (MS)

Kumar, David. (1997). **Public school choice and science education: A survey of preservice elementary teachers.** *Contemporary Education, 18*(3), 170-173.

This study assessed 73 preservice elementary teachers' attitudes toward public school choice and science education. Survey data indicated that they moderately supported public school choice, perceived it as a means of improving student science performance and program competitiveness, and perceived parental choice favorably.

att, ref (EL, TE)

Kyburz-Graber, Regula; et al. (1997). **A socio-ecological approach to interdisciplinary environmental education in senior high schools.** *Environmental Education Research, 3*(1), 17-28.

Presents research founded on a socio-ecological approach to environmental education that includes individual and structural aspects of environmental awareness and problem solving. Presents one instrument used in discussions with teacher teams.

ene, pbs, ped, tpd (SE)

Lavoie, Derrick R. (1997). **Delivering university science content/education courses to high school science teachers via telecommunications: An evaluation.** *Electronic Journal of Science Education, 1*(4) [1997, June 1]. Retrieved September 9, 1998 from the World Wide Web. [http://unr.edu/homepage/jcannon/ejse/lavoie.html]

This study examines the effectiveness of teaching university courses to high school science teachers via a software conferencing system. The study also assessed attitudes, learning outcomes, and interactions between participants and instructors.

edt, tpd, ntw (TE)

Linn, Marcia C. (1997). **The role of the laboratory in science learning.** *Elementary School Journal, 97*(4), 401-417.

Gives historical account of research and practices associated with precollege science laboratories. Described three social contexts of research on science laboratories: separation, interaction, and partnership. Argues that more partnerships are needed to continue improvement to the science laboratory.

lab, his (K-12)

List, Juliane. (1997). **Employment opportunities for university graduates in Europe.** *Vocational Training: European Journal, 10*, 5-14.

The labor market for college graduates in Europe is better than for non-graduates. However, economists, engineers, and natural scientists fare better than humanities and social science graduates. Temporary positions are increasing among entry level workers.

car (PS)

Liu, Chin Tang; Yager, Robert E. (1997). **The Iowa Scope, Sequence, and Coordination project: A middle school science reform program approved by the National Diffusion Network.** *Research in Middle Level Education Quarterly, 20*(4), 77-105.

Examines learning in science concepts, process, application, creativity, attitude, and world view of students participating in the Iowa Scope, Sequence, and Coordination (SS&C) project, part of the national reform effort using the STS approach and constructivist teaching practices.

ref, sts, cns, lrg, ats, sks (MS)

Lord, Thomas R. (1997). **A comparison between traditional and constructivist teaching in college biology.** *Innovative Higher Education, 21*(3), 197-216.

A study compared student learning in two sections of an introductory college biology course for nonmajors. Groups were taught in the traditional teacher centered, lecture/laboratory format (n=86 students) and in a student centered constructivist format (n=98). The latter group performed significantly better on the same tests, maintained a better attitude throughout, and enjoyed the course more.

cns, ped, lrg, ats (PS)

Lord, Thomas; Holland, Melinda. (1997). **Preservice secondary education majors and visual-spatial perception: An important cognitive aptitude in the teaching of science and mathematics.** *Journal of Science Teacher Education, 8*(1), 43-53.

Finds that preservice teachers in science/ mathematics, mechanics/fine arts, and allied health/ physical education fields scored significantly higher on spatial ability tests than preservice teachers in history/social studies and English/humanities fields. Gender differences were not significant in the higher-scoring majors.

chs, sks, gen (TE)

Loving, Cathleen C.; Marshall, James E. (1997). **Increasing the pool of ethnically diverse science teachers: A mid-project evaluation.** *Journal of Science Teacher Education, 8*(3), 205-217.

Describes a project to recruit and retain minority students as preservice science teachers. Successes and modifications are discussed, and implications for similar efforts are given.

tpd, eth, eqt, car (TE)

Lu, Casey R.; et al. (1997). **The effect of a microcomputer-based biology study center on learning in high school biology students.** *American Biology Teacher, 59*(5), 270-278.

Describes a Computer-Assisted Instruction (CAI) package covering biology concepts for an entire school year and evaluates the effect of this CAI on learning. Findings indicate positive effects of CAI on achievement and attitude.

cbi, ach, ats, bio (HS)

Lynch, Sharon. (1997). **Novice teachers' encounter with national science education reform: Entanglements or intelligent interconnections?** *Journal of Research in Science Teaching, 34*(1), 3-17.

Reports on a project where 25 preservice and recently-inducted science teachers analyzed materials of Project 2061 and the National Science Education Standards, created an evaluation instrument, and developed and analyzed teaching units.

asm, mat, ref, tpd, cur, ped (K-12)

Marques, Luis; Thompson, David. (1997). **Portuguese students' understanding at ages 10-11 and 14-15 of the origin and nature of the earth and the development of life.** *Research in Science and Technological Education, 15*(1), 29-51.

Uses interviews and a written questionnaire to probe students' ideas on the origin of earth and life on earth. A significant number of commonly held misconceptions were prevalent in the sample (n=493).

alf, evo (EL, SE)

Mastrilli, Thomas M. (1997). **Instructional analogies used by biology teachers: Implications for practice and teacher preparation.** *Journal of Science Teacher Education, 8*(3), 187-204.

Describes an ethnographic investigation of nine science teachers' use of analogies during instruction. Found that the teachers studied did not have adequate knowledge of the functional or cognitive use of analogies in their classrooms. Implications for teacher education are discussed.

ped, cid, tpd (TE)

Mazzoni, Dale S.; et al. (1997). **Perspectives on the instruction of biological aging courses.** *Educational Gerontology, 23*(6), 549-565.

Biological aging courses should be taught to nonmajors, whose mixed backgrounds require appropriate strategies such as alteration of content order, decompartmentalization, and relating material to social sciences. Appropriate textbooks should be understandable without a science background and integrate the topic with other disciplines.

cur, ped, bio (PS)

McDonald, Robert B. (1997). **Using participation in public school "Family Science Night" programs as a component in the preparation of preservice elementary teachers.** *Science Education, 81*(5), 577-595.

Describes a series of science programs that involve university students, elementary students, and their parents in hands-on science activities. Conclusions are based on qualitative data collected from observations of the cooperative groups formed by the participants.

hos, nfd, tpd, ntw, cpl (ALL)

McFarland, Jacqueline L. (1997). **A comparison of regular students and students with learning disabilities on a performance-based assessment in the area of science.** *Learning Disabilities:A Multidisciplinary Journal, 8*(2), 109-115.

Examined the performance of middle school students with learning disabilities (n=86) or without (n=39) on the Science Appraisal Battery. Regular education students outperformed students with learning disabilities on all portions of the test and on both verbal and hands-on questions.

asm, chs, eqt, sks (MS)

McKenna, Bernard. (1997). **How engineers write: An empirical study of engineering report writing.** *Applied Linguistics, 18*(2), 189-211.

Trials an analysis of engineering reports using a modified version of Gosden's (1993) analysis of the science research article. Using Hallidayan sociolinguistic concepts, the analysis demonstrates how engineering writers linguistically convert real world entities and processes into non real world concepts.

sks, tec, res (GEN)

Medin, Douglas L.; et al. (1997). **Categorization and reasoning among tree experts: Do all roads lead to Rome?** *Cognitive Psychology, 32*(1), 49-96.

Results of two experiments concerned with categorization among different types of tree experts (4 taxonomists, 10 landscape workers, and 10 park maintenance employees in the first experiment and a subset of these experts in the second) show a pattern of similarities and differences.

car, phe, lth (GEN)

Mellado, Vicente. (1997). **Preservice teachers' classroom practice and their conceptions of the nature of science.** *Science and Education, 6*(4), 331-354.

Describes research conducted with student teachers of elementary and secondary science education. Analyzes and compares the preservice teachers' conceptions of science with their classroom practices when teaching a science lesson. Results indicate that there is no correspondence between student teacher conceptions of the nature of science and classroom practice.

nas, ped, bft, tpd (TE)

Meyer, Karen; Woodruff, Earl. (1997). **Consensually driven explanation in science teaching.** *Science Education, 81*(2), 173-192.

Focuses on one target group of seventh grade science students (n=19) who are working to achieve consensus and a coherent explanation of light and shadow effects. Articulates the beginnings of a framework for consensus building with inquiry discourse.

cid, inq (MS)

Meyling, Heinz. (1997). **How to change students' conceptions of the epistemology of science.** *Science and Education, 6*(4), 397-416.

Part One of this article presents empirical results of students' epistemological conceptions of laws, hypotheses, theories, and models. These results are discussed in relation to research results from different recent publications. Part Two gives an outline and analysis of a two-year program for teaching epistemology in a physics course.

phe, ccg, nas, ped, phy (SE)

Moore, Richard W.; Foy, Rachel Leigh Hill. (1997). **The scientific attitude inventory: A revision (SAI II).** *Journal of Research in Science Teaching, 34*(4), 327-336.

Describes the development of a revised Scientific Attitude Inventory (SAI II). Reports on a field test of the revised instrument. Concludes that the revised instrument is a significant improvement over the original.

ats, asm (K-12)

Morrow, Lesley Mandel; et al. (1997). **The effect of a literature-based program integrated into literacy and science instruction with children from diverse backgrounds.** *Reading Research Quarterly, 32*(1), 54-76.

Determines the impact of a literature-based program integrated into literacy and science instruction on achievement, use of literature, and attitudes toward the literacy and science program. Finds that literature/science group children scored better on all literacy measures than literature only group children, who scored better on all measures than control group children.

int, ach, ats (EL)

Mueller, Andrea. (1997). **Discourse of scientific inquiry in the elementary classroom.** *Journal of Elementary Science Education*, 9(1), 15-33.

Presents two studies that explore the connection between students' language use and how they participate in small group science activities. Describes the range of language used by groups of students while working with materials in several elementary science classrooms. Also examines how students use language in small groups to discuss, clarify, and build knowledge about the task at hand.

cid, cpl, lth (EL)

Naizer, Gilbert L. (1997). **Validity and reliability issues of performance portfolio assessment.** *Action in Teacher Education, 18*(4), 1-9.

This study evaluated the validity and reliability of performance portfolios in a preservice elementary mathematics/science methods class, assessing students' domain strategic and general learning strategic knowledge. Results supported performance portfolios as a valid method of assessing desired abilities of preservice teachers that can be reliably graded.

asm, tpd (TE, EL)

Neathery, M. Faye. (1997). **Elementary and secondary students' perceptions toward science: Correlations with gender, ethnicity, ability, grade, and science achievement.** *Electronic Journal of Science Education, 2*(1) [1997, September 1]. Retrieved September 9, 1998 from the World Wide Web. [http://unr.edu/homepage/jcannon/ejse/neathery.html]

This study found significant relationships between ability and four student attitudes toward science. Students of high ability rated science as valuable, understandable, and easy; whereas, students of low ability rated science as important.

ats, chs, sks, gen, eth (K-12)

Nelson, Mike; Pan, Alex. (1997). **Integrating the concept attainment teaching model and videodisk images.** *Journal of Elementary Science Education, 9*(1), 34-48.

Investigates preservice elementary teachers' responses to a concept attainment task using videodisk pictures and line drawings. Findings indicate that students using videodisk pictures used inferences to construct patterns while students using line drawings in connection with pictures significantly made more observations and developed fewer ideas to make viable patterns.

edt, lrg, knt (TE, EL)

Niaz, Mansoor. (1997). **Can we integrate qualitative and quantitative research in science education?** *Science and Education, 6*(3), 291-300.

Emphasizes the importance of integrating qualitative and quantitative research methodologies in science education. Reviews literature in areas relevant to science education to show that researchers are far from advocating qualitative research as the only methodology.

res (GEN)

Nichols, Sharon E.; Tippins, Deborah; Wieseman, Katherine. (1997). **A toolkit for developing**

critically reflective science teachers. *Journal of Science Teacher Education, 8*(2), 77-106.

Reviews research and details authors' experiences using portfolios, journals, cases, learning maps, stories re-told, metaphors and proverbs to engage prospective teachers in the process of self-reflection and evaluation.

tpd, res, skt (TE)

Norby, Rena F. (1997). **Evaluating progress in gender equity in careers for women in science and technology: The impact of role modeling on women's career choices.** *Electronic Journal of Science Education, 1*(3) [1997. March 1]. Retrieved September 9, 1998 from the World Wide Web. [http://unr.edu/homepage/jcannon/ejse/norby.html]

This report summarizes the results of the responses to a survey to identify the effects of role models on the career choices of women in technology-related professions. Implications for teacher and science professionals planning instructions are discussed.

car, ntw, gen, tpd, tec, eqt (ALL)

Orion, Nir; et al. (1997). **Development and validation of an instrument for assessing the learning environment of outdoor science activities.** *Science Education, 81*(2), 161-171.

Describes the development of the Science Outdoor Learning Environment Inventory which includes seven scales. The instrument was used by high school students (n=643) and the results indicate that the instrument is a sensitive measure that differentiates between various types of field trips.

fsd, asm (HS)

Pace, Paul. (1997). **Environmental education in Malta: Trends and challenges.** *Environmental Education Research, 3*(1), 69-82.

Analyzes the main events that characterize the development of environmental education in Malta. Focuses on three major evolutionary stages of that development: (1) the awareness stage; (2) the fragmentary stage; and (3) the coordinated stage.

ene, cur, his (K-12)

Palmer, David H.; Flanagan, Ross B. (1997). **Readiness to change the conception that "motion-implies-force:" A comparison of 12-year-old and 16-year-old students.** *Science Education, 81*(3), 317-331.

Explores whether older students were less ready to change their alternative conceptions than younger students. Findings indicate that after reading a refutational text, conceptual change occurred in 35% of year six students and 44% of year 10 students. Concludes that there was no evidence to suggest that conceptual change is more difficult for older students.

alf, ccg, phy (SE)

Palmquist, Bruce C.; Finley, Fred N. (1997). **Preservice teachers' views of the nature of science during a postbaccalaureate science teaching program.** *Journal of Research in Science Teaching, 34*(6), 595-615.

Investigates preservice science teachers' views of the nature of science and describes changes in those views during a teacher education program.

bft, nas, ccg, tpd (TE)

Park, Jongwon; Pak, Sungjae. (1997). **Students' responses to experimental evidence based on perceptions of causality and availability of evidence.** *Journal of Research in Science Teaching, 34*(1), 57-67.

Investigates students' causal beliefs about the relationship between variables in an electric experiment and the degree to which their tendency to make either idea-based or evidence-based statements depends on a prior belief about the causal efficacy of that variable.

kns, phy (MS)

Parker, Joan. (1997). **Developing enthusiastic primary science teachers.** *Education in Science*, (173), 18-19.

Presents a student's eye view of science education. The views emerged from a three-year research and evaluation study carried out at the Manchester Metropolitan University in England that involved preservice primary teachers.

tpd, att (TE, EL)

Parkinson, Jean; Adendorff, Ralph. (1997). **Two streams of literacy in science: A look at first-year laboratory manuals.** *Language and Education, 11*(3), 200-221.

Reports on an ethnographic study of laboratory sessions in the departments of Physics and Chemistry at the University of Natal in Durban, South Africa, with specific focus on the comparison of the function of verbs in three first-year laboratory manuals.

lab, mat, lit (PS)

Parsons, Eileen Carlton. (1997). **Black high school females' images of the scientist: Expression of culture.** *Journal of Research in Science Teaching, 34*(7), 745-768.

Investigates black high school females' images of scientists. Descriptions of the scientist differed with the ethnicity ascribed to him or her, and these differences corresponded to the cultural orientation—the dominant culture or the African-American culture in the United States.

eth, gen, nas, bkg, car (HS)

Penner, David E.; et al. (1997). **Building functional models: Designing an elbow.** *Journal of Research in Science Teaching, 34*(2), 125-143.

Describes a study that investigated the role of a design context for developing children's understanding of science as the construction and revision of models. Results indicate that as early as the first grade, children's model-evaluation skills may be quite amenable to development.

rem, sks, nas, lrg (EL)

Ploetzner, Rolf; Van Lehn, Kurt. (1997). **The acquisition of qualitative physics knowledge during textbook based physics training.** *Cognition and Instruction, 15*(2), 169-205.

Used computerized simulation models of qualitative, conceptual problem solving and quantitative problem solving to examine qualitative physics knowledge acquisition during textbook based physics training.

cbi, pbs, kns, lrg, mat (K-12)

Pole, Christopher J.; et al. (1997). **Supervision of doctoral students in the natural sciences: Expectations and experiences.** *Assessment & Evaluation in Higher Education, 22*(1), 49-63.

Interviews with doctoral students and supervisors in physics, mathematics, and engineering attending nine English universities investigated student expectations of doctoral supervision, extent to which expectations were met, and the ways in which supervision changes as the doctoral process progresses.

ats, car, ntw (PS)

Polzella, Lugene. (1997). **Gifted students suggest reforms for education: Listening to gifted students' ideas.** *Gifted Child Today Magazine, 20*(4), 30-35.

A survey of 50 students (grades 4-11) returning to a gifted summer program provided several suggestions for regular schools. Suggestions included curriculum related field trips, serving individual student interests, use of college campus facilities, flexible school policies and teacher planning, hands-on science and technology, and opportunities for gifted students to work together.

chs, hos, ats, cur (K-12)

Powell, Richard R. (1997). **Teaching alike: A cross case analysis of first career and second career beginning teachers' instructional convergence.** *Teaching and Teacher Education, 13*(3), 341-356.

This study examined how prior knowledge and experience influenced first career and second career beginning science teachers' curriculum and classroom instruction. Observations and interviews indicated that teachers compromised their beliefs about good content and became similar by the end of the year.

cht, knt, ped, bft, bkg, cur (TE)

Preece, Peter F. W. (1997). **Force and motion: Pre-service and practising secondary science teachers' language and understanding.** *Research in Science and Technological Education, 15*(1), 123-128.

Explores the language used by teachers to denote various forces and investigates possible misconceptions they might hold about force and motion. Results indicate that biology and chemistry specialists hold the most misconceptions.

alf, knt, phy (SE)

Ramey-Gassert, Linda. (1997). **Learning science beyond the classroom.** *Elementary School Journal, 97*(4), 433-450.

Examines a cross-section of craft knowledge and research-based literature of science learning beyond the classroom. Describes informal science education programs, and discusses implications for science teaching, focusing on the importance of informal science learning for children and in-service and preservice teachers. Proposes a model for enhanced science education and policy change.

nfd, lrg (EL, TE)

Raun, William R.; et al. (1997). **Nitrogen cycle ninja: A teaching exercise.** *Journal of Natural Resources and Life Sciences Education, 26*(1), 39-42.

Assesses the effectiveness of using pop quizzes and rewards to improve student retention of the nitrogen cycle. Students able to diagram the N-cycle on pop quizzes were rewarded with special cards that included the N-cycle. These cards could then be used on subsequent tests. Three months later, 6 of 11 students retained the information.

ped, lrg (PS)

Robinson, Michael; et al. (1997). **The ranking of global environmental issues and problems by Polish secondary students and teachers.** *Electronic Journal of Science Education, 2*(1) [1997, September 1]. Retrieved September 9, 1998 from the World Wide Web. [http://unr.edu/homepage/jcannon/ejse/rob_etal.html]

This study surveyed over 700 participants about global environmental issues/problems. Participants ranked air quality and hazardous substances as the most important problems and energy shortages and mineral resources as the least important.

bfs, bft, sts, ene (SE)

Roth, Wolff-Michael; et al. (1997). **The local production of order in traditional science laboratories: A phenomenological analysis.** *Learning and Instruction, 7*(2), 107-136.

A study of the processes by which grade-12 Australian physics students (n=24) brought order to their observations and practices shows that the phenomena students construct from their laboratory work (not always accurate) develop from connections among the embodied practices of language and physical action, their world, and social relations.

cns, lth, cid, alf, bkg (HS)

Roth, Wolff-Michael; et al. (1997). **Why may students fail to learn from demonstrations? A social practice perspective on learning in physics.** *Journal of Research in Science Teaching, 34*(5), 509-533.

Explores why students fail to learn from teacher demonstrations in a physics course. Reports that six dimensions may have prevented student learning, including lack of a theoretical framework to separate signals from noise, interference of discourses learned in other contexts, and problems in piecing together coherent representational frameworks.

ped, lrg, cid, lth, rem (SE)

Roth, Wolff-Michael; Lucas, Keith B. (1997). **From "truth" to "invented reality:" A discourse analysis of high school physics students' talk about scientific knowledge.** *Journal of Research in Science Teaching, 34*(2), 145-179.

Presents a study that analyzes an extensive database consisting of the written and oral discourse of students (n=23) as they described their thoughts on ontology, epistemology, and sociology of scientific knowledge.

cid, phe, nas, bfs (SE)

Rowell, Patricia M.; Gustafson, Brenda J.; Guilbert, Sandra M. (1997). **Problem solving through technology: An interpretive dilemma.** *Alberta Journal of Educational Research, 43*(2-3), 86-98.

Interviews with 20 engineers revealed that their approach to technological problem solving bore little resemblance to the model of "problem solving through technology" in the Alberta elementary science curriculum. Engineers emphasized the importance of context and previous experience in making decisions about each unique situation, whereas the school program suggests a sequence to be used in all contexts.

pbs, cur, tec, bkg (EL)

Rowsey, Robert E. (1997). **The effects of teachers and schooling on the vocational choice of university research scientists.** *School Science and Mathematics, 97*(1), 20-26.

Investigates the influences of teachers and schooling on 35 research scientists. Results indicate that 63% of the subjects had identified a genuine interest in science by ninth grade. Only 9% of them attributed this to elementary or junior high teachers while 43% were influenced by one or more high school teachers.

bkg, car (GEN)

Rye, James A.; Dana, Thomas M. (1997). **Teaching beliefs and practices of a research scientist faculty member engaged in Science-Technology-Society (STS) instruction.** *Electronic Journal of Science Education, 1*(4) [1997, June 1]. Retrieved September 9, 1998 from the World Wide Web. [http://unr.edu/homepage/jcannon/ejse/ryedana.html]

This case study investigates the teaching beliefs and practices of a research scientist instructor. Data collected through interviews and observations present the classroom culture and instructional practices that model the methods of practicing scientists.

sts, bft, ped, bkg, nas (PS)

Saddler, Danielle Wilson. (1997). **Using effective praise to produce positive results in the classroom.** *Teaching and Change, 4*(4), 338-357.

By evaluating her use and delivery of praise, an elementary teacher discovered that its quality, not quantity, had the most impact on students. Teachers can increase the positive effects of praise by praising sparingly but carefully, directing it to students who respond well to it, and ensuring contingency, specificity, and credibility.

ped, skt, tpd (EL)

Sandifer, Cody. (1997). **Time-based behaviors at an interactive science museum: Exploring the differences between weekday/weekend and family/nonfamily visitors.** *Science Education, 81*(6), 689-701.

This study proposed to determine if time-based, learning-associated visitor behaviors at interactive science museums differ across weekend/weekday groups and family/nonfamily groups. Results separate weekday visitors into two distinct groups: family visitors spent more time per exhibit than did nonfamily visitors.

nfd, lrg (GEN)

Scharmann, Lawrence C.; et al. (1997). **Preservice secondary science teachers' orientations toward science-technology-society (STS) instruction.** *Electronic Journal of Science Education, 1*(3) [1997, March 1]. Retrieved September 9, 1998 from the World Wide Web. [http://unr.edu/homepage/jcannon/ejse/scharm.html]

This report describes a five-year action research project to examine the critical decisions that helped students in a science teaching methods course to gain confidence in using the STS instructional strategy.

sts, tpd, att, ped (TE)

Schauble, Leona; Bartlett, Karol. (1997). **Constructing a science gallery for children and families: The role of research in an innovative design process.** *Science Education, 81*(6), 781-793.

The role of research in designing ScienceWorks, an innovative gallery at The Children's Museum of Indianapolis, is described. The gallery was constructed on the basis of existing and new research on how children think and learn about science.

nfd, res (GEN)

Schmidt, Hans-Jurgen. (1997). **Students' misconceptions— looking for a pattern.** *Science Education, 81*(2), 123-135.

Describes four chemical terms that students with well-considered reasons use in ways that are not accepted in chemistry. Senior high school students completed a series of multiple choice tests while other groups of students participated in discussions about the problem situations.

alf, che, lit, kns (HS)

Shanahan, James; McComas, Katherine. (1997). **Television's portrayal of the environment: 1991-1995.** *Journalism and Mass Communication Quarterly, 74*(1), 147-159.

Finds that nature as a theme is completely absent in 80% and the outstanding theme in only 1.7% of television programming; not only less frequent, but separate from the dominant themes in prime time; and treated as a sociopolitical "issue" (like "politics," "science," "religion," and "education").

bkg, sts, mat, nfd, ene (GEN)

Shaw, Jerome M. (1997). **Threats to the validity of science performance assessments for English Language Learners.** *Journal of Research in Science Teaching, 34*(7), 721-743.

Describes the study of a science performance assessment with 96 English Language Learners (ELL) in five high school science classes investigating the face, construct, and consequential validity of an intersection. ELL spelling and syntax on some responses were significant sources of error. Recommendations included.

mce, asm, sks (SE)

Sheehan, Richard D. Johnson. (1997). **The emergence of a root metaphor in modern physics: Max Planck's "quantum" metaphor.** *Journal of Technical Writing and Communication, 27*(2), 177-190.

Uses metaphorical analysis to determine whether or not Max Planck invented the quantum postulate. Demonstrates how metaphorical analysis can be used to analyze the rhetoric of revolutionary texts in science.

his, mat (GEN)

Shepardson, Daniel P. (1997). **The nature of student thinking in life science laboratories.** *School Science and Mathematics, 97*(1), 37-44.

Compares the nature of student thinking in confirmation and open-inquiry laboratory activities. Reports that student thinking processes exhibited in confirmation laboratories emphasized procedures and techniques, whereas student thinking in open-inquiry laboratories emphasized data analysis.

inq, lab, lrg, lth, bio (SE)

Shymansky, James A.; et al. (1997). **A professional development system as a catalyst for changing science teachers.** *Journal of Science Teacher Education, 8*(1), 29-42.

Describes the development and testing of a Professional Development System (PDS), created in response to the need to evaluate the Science: Parents, Activities and Literature project. The PDS provides systematic and comparable evidence about curriculum planning, classroom teaching, and leadership that can be used to clarify constructivist practice and document professional growth.

cns, asm, tpd (TE)

Shymansky, James A.; et al. (1997). **Examining the construction process: A study of changes in Level 10 students' understanding of classical mechanics.** *Journal of Research in Science Teaching, 34*(6), 571-593.

Explores students' conceptual understanding and conceptual growth in classical mechanics in the natural context of a Grade 10 science classroom. Findings indicate that students' knowledge structures remained stable for 10 weeks and unchanged for four weeks after instruction ceased.

ccg, cns, phy (SE)

Sing, Lee; Chee, Chia Teck. (1997). **Microcomputer simulated experiments in the teaching of multi-channel laser system in an undergraduate course.** *Journal of Computers in Mathematics and Science Teaching; 16*(1), 25-36.

Describes a simulation done by students in a Year 4 undergraduate physics laboratory course on pulse technology. Results showed that the microcomputer simulated experiments made for a more comprehensive understanding of the multi-channel laser system.

cbi, tec, lrg, phy (PS)

Sitman, Francis X.; et al. (1997). **Hands-on science and basic-skills learning by culturally and academically diverse students: A test of the IALS.** *Journal of Curriculum and Supervision, 12*(4), 356-366.

Summarizes a study to determine effects of the Integrated Activity Learning Sequence (IALS) instructional approach on fourth graders' science, mathematics, and writing achievement; to discover teachers' and students' attitudes toward this approach; and to determine if nonscience elementary teachers could develop science instructional materials.

ped, ats, att, tpd, cur (EL)

Slater, Timothy F. (1997). **The effectiveness of portfolio assessments in science.** *Journal of College Science Teaching, 26*(5), 315-318.

Discusses the use of portfolio assessment strategies for more lengthy, complex, and authentic student assessments. Reports on an investigation to determine the effectiveness of portfolio strategies. Concludes that portfolio assessment procedures enhance conceptual understanding and attitudes towards learning and evaluation in the college science classroom.

asm, lrg, ats (PS)

Smith, Carol; et al. (1997). **Teaching for understanding: A study of students' preinstruction theories of matter and a comparison of the effectiveness of two approaches to teaching about matter and density.** *Cognition and Instruction, 15*(3), 317-393.

Compared Introductory Physical Science (IPS) and Modified approaches to teaching physics concepts. Found that students' preinstruction ideas of matter and density were organized in commonsense theories that constrained understanding of density.

alf, ped, ccg (SE)

Smith, Robin G. (1997). **"Before teaching this I'd do a lot of reading:" Preparing primary student teachers to teach science.** *Research in Science Education, 27*(1), 141-154.

Investigates student teachers' understanding of science and their ability to learn what was needed when it was required for teaching purposes. Findings indicate that half the students were able to prepare themselves adequately through independent research with guidance although their initial background knowledge of science was weak.

knt, tpd (TE)

So, Winnie Wing-Mui. (1997). **A study of teacher cognition in planning elementary science lessons.** *Research in Science Education, 27*(1), 71-86.

Uses a qualitative approach to uncover a teacher's thinking process during planning and to depict a more holistic view of the structural complexity of teacher cognition during lesson planning.

knt, lrg, skt, cur, ped (EL)

Song, Jinwoong; et al. (1997). **Exploring the parallelism between change in students' conceptions and historical change in the concept of inertia.** *Research in Science Education, 27*(1), 87-100.

Investigates students' (n=736) conceptions of inertia and compares these conceptions with historical changes in the concept. Findings indicate considerable similarities as well as dissimilarities between students' conceptions and the views of past scientists.

ccg, his, phe, phy (SE)

Spear, Margaret. (1997). **The influence of contrast effects upon teachers' marks.** *Educational Research, 39*(2), 229-233.

Teachers (n=336) evaluated three samples of written work of differing quality. The sequence of samples was rotated. Good work was assessed more favorably when it followed lower quality work than when it preceded it.

asm, skt, tpd (TE)

Stevens, Reed; Hall, Rogers. (1997). **Seeing Tornado: How video traces mediate visitor understandings of (natural?) phenomena in a science museum.** *Science Education, 81*(6), 735-747.

Reports on an exploratory study of how people see and explain a prominent exhibit (*Tornado*) at an interactive science museum (the Exploratorium). Data was assembled using a novel, technically mediated activity system (Video Traces).

nfd, tec (GEN)

Stow, William. (1997). **Concept mapping: A tool for self-assessment?** *Primary Science Review, 49*, 12-15.

Describes a study to investigate how effectively concept mapping can be used to focus children on their own learning in science and to provide a way of describing their own achievements. Findings indicate that some children were able to identify specific targets for future learning. Motivation and metacognition were the main areas of benefit.

lth, sks (EL)

Stratford, Steven J. (1997). **A review of computer-based model research in precollege science**

classrooms. *Journal of Computers in Mathematics and Science Teaching, 16*(1), 3-23.

Covers research conducted within the past 10 years on the topic of using computer models and simulations to aid science instruction at the precollege level. The research is categorized into three main areas: (1) students running preprogrammed simulations; (2) students creating dynamic models using modeling environments; and (3) students using programming environments to create simulations.

cbi, res (SE)

Summerfield, John. (1997). **Inside the investigative classroom: What's going on?** *Primary Science Review, 46*, 4-7.

Reports and discusses observations of three confident, experienced teachers organizing investigative science in their classrooms. Teachers wore microphones so that recorded data coupled with field notes formed a concise record which could be discussed with the teachers.

inq, cid (EL)

Swann, Joanna; Brown, Sally. (1997). **The implementation of a national curriculum and teachers' classroom thinking.** *Research Papers in Education: Policy and Practice, 12*(1), 91-114.

This study examined the impact of Scotland's national curriculum for students ages 5-14 on: teachers' constructs of their teaching, assumptions about students' learning, and interpretations of and accommodations for student differences.

cur, bft, ref (TE)

Tamir, Pinchas. (1997). **Studying children's conceptions of life: An example of research carried out by preservice science teachers.** *Journal of Science Teacher Education, 8*(4), 241-256.

Details the findings of action research carried out by preservice teachers to ascertain children's (n=418) notions of animism and differentiation between living and nonliving things. Ninety-nine percent of children correctly classified animals as living, 80% correctly classified plants as living and inanimate objects as nonliving, and only 56% classified embryos as living.

alf, kns, res, tpd (TE, EL)

Thoresen, Carol. (1997). **Early career support program: Telecommunication mentoring for rural teachers.** *Journal of Science Teacher Education, 8*(4), 283-293.

Reports on the Montana Educational Telecommunication Network established to connect early career teachers in rural Montana with mentor teachers. Participants reported high levels of satisfaction with the program and showed ample evidence of professional development and collaboration. Recommendations are given.

ntw, tpd, tec (TE)

Tiberghien, A.; de Vries, E. (1997). **Relating characteristics of teaching situations to learner activities.** *Journal of Computer Assisted Learning, 13*(3), 163-174.

Compares collaborative problem solving by learners sitting side by side with computer mediated learning at a distance. Three aspects are studied: high school students' problem solving strategies and interpretation of the teaching situation; their use of components of the situation; and the cognitive processes involved in understanding domain knowledge, energy in physics.

pbs, cpl, edt, kns, lsy, phy (HS)

Tinker, Robert F. (1997). **Student scientist partnerships: Shrewd maneuvers.** *Journal of Science Education and Technology, 6*(2), 111-117.

Explores student-scientist partnerships (SSPs) that help students gain a unique understanding of both the content and the process of science. Discusses the potential of SSPs, the range of SSP activities, a strategy for national impact, the educational importance of SSPs, the research importance of SSPs, and technology as a facilitator.

ntw, edt (K-12)

Toh, Kok-Aun; et al. (1997). **Open-ended investigations: Performance and effects of pre-training.** *Research in Science Education, 27*(1), 131-140.

Investigates students' (n=277) performance and the effects of pre-training on tasks rated high in ambiguity, in particular those where the solution to the tasks cannot be arrived at through predictable algorithms.

pbs, sks (K-12)

Trumper, Ricardo. (1997). **Learning kinematics with a V-Scope: A case study.** *Journal of Computers in Mathematics and Science Teaching, 16*(1), 91-110.

Studies the effect of V-Scope activities on the performance of 11th-grade students in analyzing kinematics graphs. Results indicate that the V-Scope kinematics laboratory activities can promote kinematics concepts and graphing skills.

edt, lab, sks, phy (HS)

Trumper, Ricardo. (1997). **Applying conceptual conflict strategies in the learning of the energy concept.** *Research in Science and Technological Education, 15*(1), 5-18.

Reports on a study which addresses the implications of instructional strategies that are used to create cognitive disequilibrations in order to achieve conceptual change. Discusses several difficulties in the application of such conceptual change strategies.

ccg, ped (SE)

Tunnicliffe, Sue Dale. (1997). **Birds, bees and babies.** *Primary Science Review, 49*, 16-19.

Presents a study designed to determine which particular aspects of pregnancy, birth, and babies were of most interest to 8-year-old children. Children were interested in details of a baby's behavior and development as well as the impact of its arrival on the parents. There were distinct gender differences in those topics which particularly interested boys and girls.

ats, bio, cur, gen (EL)

Ursyn, Anna. (1997). **Computer art graphics integration of art and science.** *Learning and Instruction, 7*(1), 65-86.

The effects of the integration of art and science through instruction in computer art graphics on learning geology were studied with 53 college students and 189 comparisons in the same geology class. Results indicate that building representations of scientific concepts through computer art may improve students' achievement.

int, rem, lrg, edt, esg (PS)

Van Lanen, Robert J.; Lockie, Nancy M. (1997). **Using supplemental instruction to assist nursing students in chemistry.** *Journal of College Science Teaching, 26*(6), 419-423.

Describes the use of supplemental instruction in an introductory chemistry course designed for freshman nursing students and explores its impact on student performance and response to the program. Results indicate a positive impact of supplemental instruction and its popularity with students.

ped, ats, ach, che (PS)

Wang, Jianjun; Staver, John R. (1997). **An empirical study of gender differences in Chinese students' science achievement.** *Journal of Educational Research, 90*(4), 252-255.

Reports a study that investigated gender equity in science education based on a random national sample of over 12,000 ninth graders in five rural and urban Chinese provinces.

gen, ach, eqt (HS)

Watters, James J.; Ginns, Ian S. (1997). **An in-depth study of a teacher engaged in an innovative primary science trial professional development project.** *Research in Science Education, 27*(1), 51-69.

Explores the involvement and professional growth of a teacher in a professional development project entitled "Simply Science." Findings indicate an increase in the teacher's pedagogical content knowledge and confidence in teaching science and a change in her views about cooperative learning strategies.

knt, ped, cpl, tpd, bft (TE)

Watts, Mike; Barber, Brenda; Alsop, Steve. (1997). **Children's questions in the classroom.** *Primary Science Review, 49*, 6-8.

Presents accounts from primary teachers as they worked towards fostering questioning. Techniques included providing good stimuli for questions, having students share thoughts in groups of increasing size, and modeling good questions and question-asking.

ped, cid, skt, sks, cpl (TE)

Watts, Mike; Gould, Gillian; Alsop, Steve. (1997). **Questions of understanding: Categorizing pupils'**

questions in science. *School Science Review, 79*(286), 57-63.

Explores the extent to which student questions are indicative of understanding as well as strategies for encouraging questioning. Student questions are categorized as consolidation questions, exploratory questions, and elaboration questions.

kns, skt, ped, tpd (K-12)

Weiss, Iris R. (1997). **The status of science and mathematics teaching in the United States: Comparing teacher views and classroom practice to national standards.** *ERS Spectrum, 15*(3), 34-39.

The 1993 Survey of Science and Mathematics Education, involving a national probability sample of 1,250 U.S. schools and 6,000 teachers, probed the status of science and mathematics education as they relate to National Council of Teachers of Mathematics and the National Research Council's standards.

ref, ped, bft, cur (K-12)

Whittemore, C. T.; et al. (1997). **Description and evaluation of methods for the learning of interpersonal, transferable and management skills by students of animal science.** *European Journal of Agricultural Education and Extension, 3*(4), 197-216.

A nine week course attempted to develop the interpersonal, transferable, and management skills of animal science students through team exercises. It was successful in improving most of the 23 skills, but made little or no change in working to schedule, listening, or absorbing spoken information.

sks, ped, cpl (PS)

Whittington, M. Susie; et al. (1997). **Assessment of cognitive discourse: A study of thinking opportunities provided by professors.** *Journal of Agricultural Education, 38*(1), 46-53.

Four observations of 16 agricultural science faculty at work showed that classroom discourse was predominantly at lower cognitive levels. Classes of 51 or more had the fewest higher level thinking opportunities and 400 level courses had the greatest.

cid, lrg (PS)

Wilcox, Kimberly J.; Jensen, Murray S. (1997). **Computer use in the science classroom: Proceed with caution!** *Journal of College Science Teaching, 26*(4), 258-264.

Poses some questions and practical answers to help teachers and students use computers effectively in science classes. Sample questions include: Does the increased use of computers in classrooms inhibit any student's progress toward scientific literacy? and, How do males and females respond differently to computer use in science classrooms?

edt, lit, gen, lrg (PS)

Wilkinson, John W.; Ward, Malcolm. (1997). **The purpose and perceived effectiveness of laboratory work in secondary schools.** *Australian Science Teachers' Journal, 43*(2), 49-55.

Examines student and teacher perceptions about the purpose and effectiveness of laboratory work at Year 10. The views of students and their teacher on the goals, conduct, and assessment of laboratory work were compared. Findings suggest that the relevance of laboratory work to everyday life could be made clearer to students.

lab, bfs, bft, ped, cur (HS)

Williams, Anthony; Williams, P. John. (1997). **Problem-based learning: An appropriate methodology for technology education.** *Research in Science and Technological Education, 15*(1), 91-103.

Describes an innovative teaching project that was implemented for training technology teachers in Australia. Presents a rationale for using a problem-based learning collaborative methodology in technology teacher training.

pbs, tec, cpl, ped,tpd (TE)

Windschitl, Mark. (1997). **Student epistemological beliefs and conceptual change activities: How do pair members affect each other?** *Journal of Science Education and Technology, 6*(1), 37-47.

Describes a study that examined the relationships in achievement between members of dyads who were paired according to epistemological maturity. Also examines the relationship between individual students' epistemological maturity and their understanding of photosynthesis.

cpl, ccg, kns, phe, bio (PS)

Wood, Tandra L. Tyler; Cass, Michael A.; Potter, Les. (1997). **Effects of an outdoor science laboratory program on middle school students.** *ERS Spectrum, 15*(3), 30-33.

Evaluate effects of an outdoor "hands-on," cooperative science laboratory on seventh and eighth grade students' environmental knowledge levels and science processing skills. Results support involving students in lab work allowing them to test hypotheses, conduct experiments, analyze data, and generate conclusions.

fsd, hos, sks, ene, kns, lrg (MS)

Woodruff, Earl; Meyer, Karen. (1997). **Explanations from intra- and inter-group discourse: Students building knowledge in the science classroom.** *Research in Science Education, 27*(1), 25-39.

Examines student discourse in both small and large contexts. Concludes that two forms of discourse (constructive and generative, dialectic and persuasive) effectively promote progressive discourse and thereby facilitate shared coherent explanations of phenomena.

cid, cns (SE)

Woods, Donald R. (1997). **A British team assesses problem-solving skills in the field of design.** *Journal of College Science Teaching, 26*(6), 430-434.

Examines a report, The Assessment of Performance in Design and Technology, that attempts to assess problem solving abilities in the field of design. Describes pilot projects, an extended project, and some test projects. Summarizes a research project on identifying when and where design appears in the school curriculum.

pbs, tec, cur, asm (SE)

Woolnough, Brian E. (1997). **Motivating students or teaching pure science?** *School Science Review, 78*(285), 67-72.

Reports on research which identifies factors, both inside and outside the curriculum, that influence students in choosing whether or not to continue with science.

ats, bkg, cur, car (K-12)

Woolnough, Brian E.; et al. (1997). **Factors affecting student choice of career in science and engineering: Parallel studies in Australia, Canada, China, England, Japan and Portugal.** *Research in Science and Technological Education, 15*(1), 105-121.

Describes studies that utilized questionnaires and interviews to explore the factors affecting the career choices of students. Reveals differences between scientists and non-scientists with regard to their preferred learning styles and relates these differences to career choice and self-perception.

cul, car, lsy, bfs, bkg (SE)

Woolsey, Kristina; Bellamy, Rachel. (1997). **Science education and technology: Opportunities to enhance student learning.** *Elementary School Journal, 97*(4), 385-399.

Describes how technological capabilities such as calculation, imaging, networking, and portability support a range of pedagogical approaches, such as inquiry based science and dynamic modeling.

edt, ped (EL)

Wright, Lynne. (1997). **Five-year study on learning in science: Let's listen to the children.** *Primary Science Review, 46*, 12-14.

Reports a study that tracks the changes in children's ideas about science and scientific concepts through the use of interviews and questionnaires. Students responded to seven questions about science learning, scientists, and their future relationship to science.

bfs, nas, lit, car (EL)

Wubbels, Theo; Brekelmans, Mieke. (1997). **A comparison of student perceptions of Dutch physics teachers' interpersonal behavior and their educational opinions in 1984 and 1993.** *Journal of Research in Science Teaching, 34*(5), 447-466.

Compares student perceptions of their physics teachers' interpersonal behavior and teachers' self-perceptions of their behavior and their opinions about physics education in 1984 and 1993. Results indicate that teachers were more in favor of realistic teaching content in 1993 than in 1984 and behaved less dominantly and more cooperatively in 1993 than in 1984.

bfs, bft, phy, cid (SE)

Yerrick, Randy; et al. (1997). **Struggling to promote deeply rooted change: The "filtering effect" of teachers' beliefs on understanding transformational views of teaching science.** *Science Education, 81*(2), 137-159.

Presents a study that examines the beliefs of teachers (n=24) and their interpretations of a two week summer institute intended to change their treatment of scientific knowledge and assessment strategies at the classroom level.

bft, ccg, tpd, asm (TE)

Zoller, Uri; et al. (1997). **Examination-type preferences of college science students and their faculty in Israel and USA: A comparative study.** *School Science and Mathematics, 97*(1), 3-12.

Compares science examination preferences of college students and faculty in Israel and the United States. Findings indicate American students prefer traditional written examinations more than their Israeli counterparts, and there exists significant differences between students' preferences and that of their faculty.

cul, asm, ats, att (PS)

Zoller, Uri; Tsaparlis, Georgios. (1997). **Higher and lower-order cognitive skills: The case of chemistry.** *Research in Science Education, 27*(1), 117-130.

Explores student performance in chemistry examinations on items that require higher-order cognitive skills (HOCS) or lower-order cognitive skills (LOCS). Findings indicate that students performed considerably lower on questions requiring HOCS than on those requiring LOCS.

asm, sks, che (SE)

Zuckerman, June Trop. (1997). **Science supervisors' conceptions of their role as supervisor.** *Science Educator, 6*(1), 7-10.

Reports on the metaphors used by nine science supervisors to describe their supervisory functions. Findings indicate that the metaphors cohered into four distinct categories whose functions exemplify the supervisory models of manager, caregiver, politician, and colleague.

att, tpd (TE)

Zuckerman, June Trop. (1997). **Inservice science supervisors' assessments of a novice science teacher's videotaped lesson.** *Journal of Science Teacher Education, 8*(1), 15-28.

Describes the comments of nine inservice science supervisors who viewed a videotaped lesson taught by a novice biology teacher. Open-ended interviews with the supervisors revealed that while they preferred activity-centered instructional methods, their pedagogy was still essentially a traditional transmissive pedagogy.

ped, tpd, ref (TE, HS)

Journals Searched

Academic Medicine (1)
Action in Teacher Education (1)
Alberta Journal of Educational Research (1)
American Biology Teacher (4)
American Educational Research Journal (1)
Applied Linguistics (1)
Applied Measurement in Education (1)
Assessment & Evaluation in Higher Education (1)
Australian Science Teachers' Journal (1)
Biochemical Education (2)
Clearing House (1)
Cognition and Instruction (2)
Cognitive Psychology (1)
Contemporary Education (1)
Counseling Psychologist (1)
Education Evaluation and Policy Analysis (1)
Educational Gerontology (1)
Education in Science (1)
Educational Research (1)
Electronic Journal of Science Education (11)
Elementary School Journal (7)
Environmental Education Research (4)
ERS Spectrum (2)
European Journal of Agricultural Education and Extension (1)
Evaluation Practice (1)
Gifted Child Today Magazine (1)
Higher Education Management (1)
Hispanic Journal of Behavioral Sciences (1)
Innovative Higher Education (1)
Instructional Science (1)
Journal of Agricultural Education (2)
Journal of the American Society for Information Science (1)
Journal of Biological Education (1)
Journal of Career Development (1)
Journal of Chemical Education (1)
Journal of College Science Teaching (7)
Journal of Computer Assisted Learning (2)
Journal of Computers in Mathematics and Science Teaching (3)
Journal of Curriculum and Supervision (2)
Journal of Educational Media (1)
Journal of Educational Research (2)
Journal of Elementary Science Education (2)
Journal of Natural Resources and Life Sciences Education (1)
Journal of Research in Science Teaching (20)
Journal of Science Education and Technology (5)
Journal of Science Teacher Education (16)
Journal of Teacher Education (1)
Journal of Technical Writing and Communication (1)
Journalism and Mass Communication Quarterly (1)
Language and Education (1)
Learning and Instruction (2)
Learning Disabilities: A Multidisciplinary Journal (1)
Library Resources & Technical Services (1)
Measurement and Evaluation in Counseling and Development (1)
Modern Language Journal (1)
Multicultural Teaching (1)
Phi Delta Kappan (1)
Physics Education (1)
Primary Science Review (6)
Reading Psychology (1)
Reading Research Quarterly (2)
Research in Middle Level Education Quarterly (2)
Research in Science Education (10)
Research in Science and Technological Education (8)
Research Papers in Education: Policy and Practice (1)
School Effectiveness and School Improvement (1)
School Science and Mathematics (3)
School Science Review (4)
Science and Children (1)
Science Communication (1)
Science Education (24)
Science and Education (3)
Science Educator (2)
Science Scope (2)
Science Teacher (1)
Studies in Higher Education (1)
Teaching and Change (2)
Teaching and Teacher Education (1)
Vocational Training: European Journal (1)

Research Papers, Monographs, and Electronic Documents Produced in 1997

Lynda C. Titterington, *The Ohio State University*
Andrea K. Balas, *The Ohio State University*

This section lists 145 papers, monographs and electronic documents in science education research. The papers and monographs were produced in 1997 and abstracted in the ERIC database by the end of July, 1998. The electronic documents are listed as they appeared on the Internet in September or October, 1998. Some URLs are given as search or index screens when actual document URLs are unwieldy. Each entry is coded (see Key to Codes) with one to three major codes (in bold type) and up to three minor codes, as well as the educational level (in parentheses). All entries are indexed by major codes at the end of the volume (see page 103).

Alaska Challenger Learning Center Steering Committe. (1997). ***Alaska Challenger Learning Center Feasibility Report.*** Kenai, AK: Author. [SE 060 291]

The Challenger Center for Space Science Education uses space exploration as a theme to create a positive learning experience that raises students' expectations of success; fosters in them a long-term interest in math, science, and technology; and motivates them to pursue studies in these areas. This document is a feasibility report for establishing a Challenger Learning Center in the city of Kenai in Alaska.

tec, esg, ats (K-12)

American Association for the Advancement of Science. (1997). ***Project 2061: Science literacy for a changing future. Update 1997.*** Washington, DC: Author. [SE 059 993]

Reported here are highlights of a year-long evaluation of the influence of "Science for All Americans" and "Benchmarks for Science Literacy." Data for the evaluation were collected through expert interviews, reviews of state science curriculum frameworks and textbooks, telephone and mail surveys, and case studies of reform activities in six states.

ref, cur (ALL)

Bae, Yupin. (1997). ***Findings from the Condition of Education 1997 No. 11: Women in mathematics and science.*** Washington, DC: National Center for Education Statistics. [SE 060 785]

This essay reviews the most current data on women's progress in mathematics and science achievement, attitudes, course-taking patterns, and college majors. The research cited here suggests that the gender gap in science and mathematics in the United States appears at grade ten while internationally the gap appears at grade eight.

gen, eqt, ach, ats, car, cul (ALL)

Baker, William P.; Turturice, Michael W. (1997). ***Teaching biology by the Internet.*** Paper presented at the Annual Meeting of the Arizona Science Teachers Association (Mesa, AZ, October, 1997). [SE 061 036]

The purpose of this paper is to specifically demonstrate the effective application of the Internet in teaching biology. Specific strategies include accessing information via the Internet, effective search assignments, rules for appropriate use of the Internet, creating one's own web page, Internet connectivity, advanced capabilities, and individualizing instruction.

edt, ped, bio (PS, TE)

Bayer Corporation. (1997). ***The Bayer facts of science education III: A U.S. student report card on science education. Executive summary.*** Pittsburgh, PA: Author. [SE 060 290]

The report highlights research conducted to uncover what the nation's students (ages 10-17) think of their science education, how they would improve it, how they think they learn best, and how they rate their parents and teachers regarding science. Data collection included an in-depth telephone survey on attitudes toward science and science (n=1,016).

ats, bfs, ped (K-12)

Beatty, A. (Ed.). (1997). ***Learning from TIMSS: Results of the Third International Mathematics and Science Study: Summary of a symposium. Summary report. (February 3-4, 1997).*** Washington, DC: National Research Council, National Academy Press [Available online]. Retrieved September 26, 1998 from the World Wide Web. [http://www.nap.edu/search/index.html]

These conference proceedings address concerns about the research methodology and implications of TIMSS, and encourage innovative and far-sighted exploration of TIMSS resources.

ach, res (K-12)

Beatty, A. (Ed.). (1997). ***Taking stock: What have we learned about making education standards internationally competitive? Summary of a workshop. Summary report. (November 6, 1996).*** Washington, DC: National Research Council, National Academy Press [Available online]. Retrieved October 9, 1998 from the World Wide Web. [http://www.nap.edu/search/index.html]

This report presents the findings of a workshop to discuss international standards and examine why international criteria are difficult to articulate and apply. Three articles define the meaning of standards, the Australian experience with standards, and teacher practice.

cul, ref, cur (K-12)

Beeth, Michael E.; Hewson, Peter W. (1997). ***Learning to learn science: Instruction that supports conceptual change.*** Paper presented at the Annual Meeting of the European Science Education Research Association (1st, Rome, Italy, September 2-6, 1997). [SE 060 759]

This article addresses questions of how a teacher can support and facilitate conceptual change in student's thinking. The focus is on the instructional practices of one teacher and includes: description of her instruction; her learning goals; details on the presentation and analysis of data; and student responses to instruction. It concludes that students in this setting learn science content by creating a community of discourse similar to that of a science community.

ccg, ped, cid, cns (K-12)

Bennof, Richard J. (1997). ***Science and engineering state profiles: Fall 1996.*** Arlington, VA: National Science Foundation. [SE 060 287]

This document includes data from the NSF that detail the geographic distribution of the 1993 U.S. research and development spending total ($165 billion). Indicators include doctoral scientists and engineers, science and engineering doctorates awarded, science and engineering graduate students and post doctorates in the statistics tables.

res, car (PS)

Blank, Rolf K.; Langesen, Doren. (1997). ***State indicators of science and mathematics education 1997. State-by-state trends and new indicators from the 1995-96 school year.*** Washington, DC: Council of Chief State School Officers. [SE 061 077]

This report focuses on science and mathematics indicators at state and national levels. The 1997 report presents new state indicators from the 1995-96 school year and examines trends by state from 1990 to 1996 on indicators of: student achievement; content and instruction; and context and conditions for teaching.

ach, cur, ped, bkg (K-12)

Burrill, Gail; Kennedy, Donald. (1997). ***Improving student learning in mathematics and science: The role of national standards in state policy.*** Washington, DC: National Academy Press [Available Online]. Retrieved September 26, 1998 from the World Wide Web. [http://www.nap.edu/readingroom/books/isl]

This book represents a collaboration between NRC's Center for Science, Mathematics, and Engineering Education and the NCTM to analyze current reform efforts. It also recommends policies to guide and support reform in mathematics and science teaching and learning.

ref, ped, cur, lit (K-12)

Bybee, Rodger W. (1997). ***Achieving scientific literacy: From purposes to practices.*** Portsmouth, NH: Heinemann. [SE 060 988]

This book presents a broad vision for improving science education. At times it is historical and philosophical, and at other times it is concrete and practical. It addresses a number of issues that the science education community should attend to as it begins to sail toward a worthwhile destination, achieving literacy for all students.

lit, ref, phe, his, sts (K-12)

Campbell, Jay R.; Voelkl, Kristin E.; Donahue, Patricia L. (1997). ***Report in brief NAEP 1996 trends in academic progress.*** Washington, DC: National Library of Education. [SE 060 847]

This report presents the major results of the NAEP 1996 science, mathematics, reading and writing long-term assessments. These results chart trends going back to the first year in which each NAEP assessment was given: 1969/1970 in science, 1973 in mathematics, 1971 in reading, and 1984 in writing. Trends in average performance over these time periods are discussed for students at ages 9, 13, and 17 for the science, mathematics, and reading assessments.

ach (K-12)

Carr, Kevin Michael. (1997). ***A constructivist approach to reflective judgment and science literacy in introductory college science instruction.*** Paper presented at the Annual Meeting of the Northern Rocky Mountain Educational Research Association (15th, Jackson, WY, October 3, 1997). [SE 060 899]

An introductory college astronomy course was restructured along constructivist lines to better foster critical thinking about problems in science. Qualitative student data were collected (interviews, coursework, researcher fieldnotes, and learning journals). Students demonstrated significant diversity in the capacity to apply reflective judgment in the context of science.

cns, sks, pbs (PS)

Center for Science, Mathematics, and Engineering Education, National Research Council. (1997). ***Improving teacher preparations and credentialing consistent with the National Science Education Standards: Report of a symposium.*** Washington, DC: National Academy Press [Available online]. Retrieved September 9, 1998 from the World Wide Web. [http://www.nap.edu/readingroom/books/itp]

These conference proceedings include summaries of papers presented at a 1996 National Academy of Sciences symposium to identify and discuss the criteria identified by the Standards for effective science teaching and for effective professional development for teachers of science.

tpd, ref, res (TE)

Chaplin, Duncan D. (1997). ***Earnings benefits of math and science in high school.*** Paper presented at the Annual Meeting of the American Educational Research Association (Chicago, IL, April 10, 1997). [SE 060 248]

These findings suggest that mathematics skills obtained by the end of high school have a much stronger association with later earnings than science or writing skills.

sks, car, cur (SE)

Cohen, Karen C. (Ed.). (1997). ***Internet links for science education: Student-Scientist Partnerships.*** New York, NY: Plenum Press. [SE 060 764]

This volume, focusing on Student-Scientist Partnerships (SSPs), illustrates the workings and effectiveness of this new paradigm and growing force in science education. Data gathering and sharing is possible and rapid with the help of the Internet and a variety of technologies. Several SSPs are described in-depth. This book provides an understanding of these programs from multiple perspectives and encourages teachers to become involved in similar efforts.

tec, ntw, ref (PS)

Committee on Undergraduate Science Education, National Research Council. (1997). ***Science teaching reconsidered: A handbook.*** Washington, DC: National Academy Press [Available online]. Retrieved October 9, 1998 from the World Wide Web. [http://www.nap.edu/readingroom/books/str]

This book, written by scientists who are also educators, provides a path to understanding students and helping them grasp the methods of science. The book includes suggestions for having a greater impact in the classroom and provides resources for further research.

ped, tpd (PS, TE)

Council of Chief State School Officers. (1997). ***Mathematics and science content standards and curriculum frameworks: States progress on development and implementation, 1997***. Washington, DC: Author. [SE 060 846]

This report describes the changing landscape of framework development and standards-setting in the United States and identifies emerging issues for practitioners and policy makers. The study was conducted with three kinds of data concerning the current situation of state standards and frameworks in mathematics and science. A concept mapping analysis of all state curriculum frameworks and standards documents was completed.

ref (K-12)

Cournaya, Ann; Hernandez, Peggy; Valenzia, Francine. (1997). ***Helping students take responsibility for completing the scientific method.*** IL: St. Xavier University. [SE 061 060]

Strategies that enable students' use of the scientific method to solve problems during labs and activities are described. The sample included middle school students in a middle class suburban area. Their lack of understanding and application of the scientific method is documented by student/teacher surveys, teachers' lab checklist and observations.

pbs, lab, sks, ped (MS)

Crow, Tracy (Ed.); et al. (1996-1997). ***ENC focus for mathmatics and science education: New approaches to assessment in science and mathematics.*** Columbus, OH: Eisenhower National Clearinghouse. [SE 059 661]

This report serves as a guide to twenty nine instructional materials that utilize some form of alternative assessment and focus on mathematics, science, and integrated topics including one or more of the following means of student assessment: portfolios, journals, interviews, surveys, performance, and rubrics.

asm, tpd (K-12)

Denoya, Laila E. (Ed.); et al. (1997). ***The National Science Foundation Summer Science Camps: Leaving a legacy of successes.*** Arlington, VA: National Science Foundation. [SE 060 236]

This book describes the legacy of success of Summer Science Camps which are no longer funded by the NSF. These camps engaged young participants in the process of learning by doing, and encouraged students to think of mathematics and science as disciplines connected with their lives and communities and to construct experiences that promote personal scientific knowledge.

nfd, hos, sts, kns (GEN)

Directorate for Education and Human Resources, National Science Foundation. (1997). ***Local systemic change project directory.*** Arlington, VA: Author. [SE 060 749]

This directory focuses on a subset of teacher enhancement projects that engage entire school districts in the reform of science, mathematics, and technology education. Systemic change projects are characterized by a shift in the focus from the professional development of the individual teacher to the professional development of all teachers within the whole school organization.

tpd, ref (K-12, TE)

Doig, Brian. (1997). ***What makes scientific dialogue possible in the classroom?*** Paper presented at the Annual Meeting of the American Educational Research Association (Chicago, IL, March, 1997). [SE 060 856]

The research was designed to investigate ways in which practical activities can be used to foster links between upper elementary children's spontaneous concepts and Newtonian mechanics. The conclusions are presented as evidence for describing the group as engaging in scientific dialogue and for inferring solutions to the pedagogical issues raised by this video episode.

cid, ccg, ped (EL)

Ediger, Marlow. (1997). ***Affective objectives in the science curriculum.*** U.S.: Missouri. [SE 060 514]

Teaching teams of student teachers and cooperating teachers stressed student involvement in science curriculum development. They worked out a set of learning centers whereby students individually chose which tasks to pursue and which to omit in an ongoing science unit of study. Students achieved more optimally when democracy was practiced in the classroom.

cur, ref, bfs (ALL)

Ediger, Marlow. (1997). ***Excellence in the science curriculum.*** U.S.: Missouri. [SE 059 770]

Science teachers need to select tenets from the philosophy of education which stress students attaining vital content, abilities and attitudes. In this paper, diverse schools of philosophical thought are discussed in terms of how each might relate to improving the science curriculum.

phe, ref, cur, pbs, ped (ALL, TE)

Eisenhower National Clearinghouse. (1997). ***The National Network of Eisenhower Regional Consortia and National Clearinghouses Mathematics and Science Education: 1997 report.*** Columbus, OH: Author. [SE 059 667]

This report describes how the National Network of Eisenhower Regional Consortia and National Clearinghouse are accomplishing their stated objectives. Each section uses activities in a variety of geographic regions to highlight the services that are provided through the Consortia and Clearinghouses.

nfd, tpd, mat, ntw (GEN)

Erduran, Sibel. (1997). ***Reflections on the proceedings from HPSST Conferences: A profile of papers on chemistry education.*** Paper presented at the International History, Philosophy and Science Teaching, North and South America Regional Conference (Calgary, Canada, June 21-24, 1997). [SE 060 595]

Conference papers with chemistry education emphasis are investigated. The results indicate that papers with physics content dominate. Chemistry and biology content were addressed at about the same frequency. The chemistry topics covered in the papers include air pressure, equilibrium, atomic theory, and periodicity.

his, che, phe (SE, PS)

Falk, Joni; Drayton, Brian. (1997). ***Dynamics of the relationships between science teachers and scientists in an innovative mentorship collaboration.*** Paper presented at the Annual Meeting of the American Educational Research Association (Chicago, IL, March, 1997). [SE 060 597]

This paper addresses the emerging relationship between teams of high school science teachers and ecologists who were paired in a year long collaborative endeavor. The teachers and ecologists agreed on the kinds of benefits exchanged, but rank them differently in importance. Science content learning was an important value derived from this collaboration, more lasting were impact on teachers' self-perceptions and practice and from the connection to the scientists' culture. The scientists benefit from teachers' engagement with their work.

ntw, lrg, tpd (TE)

Groves, Susie. (1997). ***Making progress through scientific dialogue.*** Paper presented at the Annual Meeting of the American Educational Research Association (Chicago, IL, March, 1997). [SE 060 858]

This paper analyzes a segment of videotape showing a group of upper elementary children discussing data obtained from a practical activity where the data conflict with their intuitive models of motion. The analysis attempts to demonstrate the extent to which the dialogue is an example of "progressive classroom discourse" in terms of the notion of generating new understandings for participants.

cid, lrg (EL)

Harris, Julia (Ed.). (1997). ***Professional development for math and science. ENC Focus, 4(4), 1997.*** Columbus, OH: Eisenhower National Clearinghouse. [SE 060 755]

This issue presents 31 resources related to professional development in mathematics and science education. The resources featured in this issue were selected from the existing collection at ENC and can be used in a variety of settings: from self study to group study; in consultation with peers and supervisors; and as part of an inquiry into practice or an action research project.

tpd, mat (TE)

Harris, Julia (Ed.). (1997). ***SSRP: Software for problem solving and inquiry in grades K-4. Special***

issue of the ENC Focus series. Columbus, OH: Eisenhower National Clearinghouse. [SE 060 754]

The SchoolNet Software Review Project (SSRP) created an evaluation process and with expert teacher evaluators throughout Ohio, compiled a database of results. This report presents the results of the evaluation of 127 mathematics and science software programs. Thirty items were chosen to provide a balanced sampling of reviewed titles in terms of Average SSRP Score, price, and grade level and are presented by emphasizing their availability, abstract, SSRP evaluators' comments, and system requirements.

edt, pbs (EL)

Harris, Julia (Ed.). (1997). ***Using children's literature in math and science. ENC Focus; 5(5) 1997.*** Columbus, OH: Eisenhower National Clearinghouse. [SE 060 947]

Literature is one of the disciplines that can meaningfully be integrating mathematics and science. One way to think of the connection between children's literature and mathematics is to consider how fictional literature might influence kids' thinking about the issues that are involved in the scientific enterprises. This volume presents resources related to this issue in three sections.

int, sts, mat, ped, tpd (K-12)

Hollweg, Karen S. (1997). ***Are we making a difference? Lessons learned from VINE Program evaluations.*** Troy, OH: North American Association for Environmental Education. [SE 059 848]

The purpose of this document is to describe the evaluations conducted to determine the effectiveness of the VINE Program, and to relate what was learned about the evaluation process and the programs themselves. The focus is on a summative evaluation's questions regarding the impact of the program and whether it is accomplishing what had been intended.

ene, hos, asm (EL)

Howard Hughes Medical Institute. (1997). ***Assessing science pathways: Tracking science education and careers from precollege through professional levels. Undergraduate program.*** Howard Hughes Medical Institute Directors Meeting (September 30-October 2, 1996). [SE 060 624]

The results presented here are from a meeting of undergraduate biology departments who receive funding from the Howard Hughes Medical Institute. The discussions focus on assessment; predictors of student success in science; the importance of undergraduate research; career choices; women and underrepresented minorities; encouraging interdisciplinary collaborations; and teacher education and professional development programs for preservice, inservice, and precollege teachers.

cur, car, ntw, tpd, gen, asm (PS)

Jarrett, Denise. (1997). ***Inquiry strategies for science and mathematics learning: It's just good teaching.*** Portland, OR: Northwest Regional Educational Laboratory. [SE 060 765]

Teachers need to know how and when to use a variety of strategies for inquiry learning. This publication is intended to furnish K-12 teachers with both research-based rationale and recommendations for effective techniques that can be applied in today's complex and changing classrooms.

ref, inq, ped (K-12)

Kennedy, Mary. (1997). ***Defining optimal knowledge for teaching science and mathematics. NISE Research Monographs.*** Madison WI: Wisconsin Center for Educational Research. Retrieved October 1, 1998 from the World Wide Web. [http://www.wcer.wisc.edu/NISE/Research_Monographs/RM10-Defining_Optimal_Know.html]

This literature review discusses good teaching practice and what teachers need to know to be able to teach math and science well. Types of knowledge identified include conceptual understanding, pedagogical content knowledge, and subject-specific beliefs and attitudes.

knt, ped, res, att, bft, skt (TE, K-12)

Kirst, Michael W.; Bird, Robin L. (1997). ***The politics of developing and maintaining mathematics and science curriculum content standards. NISE Research Monographs.*** Madison WI: Wisconsin Center for Educational Research. Retrieved October 1, 1998 from the World Wide Web. [http://www.wcer.wisc.edu/NISE/Publications/Research_Monographs/RM2-Politics_of_Developing.html]

This paper discusses two issues related to math and science curriculum standards: the allocation of curriculum content, and the political issues involved in systemic change. Strategies for gaining assent to national, state, and local content standards are analyzed.

ref, cur, bkg (GEN)

Knapp, Michael S. (1997). ***Between systemic reforms and the mathematics and science classroom: The dynamics of innovation, implementation, and professional learning. NISE Research Monographs.*** Madison WI: Wisconsin Center for Educational Research. Retrieved October 1, 1998 from the World Wide Web. [http://www.wcer.wisc.edu/NISE/Publications/Research_Monographs/RM1-Dynamics_of_Innovation.html]

This monograph reviews studies and analyses of large-scale systemic reform initiatives aimed at mathematics and science education, especially those undertaken by state governments and the National Science Foundation.

res, ref (K-12)

Lee, Patrick. (1997). ***A first year evaluation study of integrated math and integrated science curricular programs in an inner city high school.*** U.S.: California. [SE 060 953]

Findings from a first year evaluation of Integrated Math and Integrated Science curricular programs implemented at Polk Academy, a high school in the San Francisco Bay area (approximately 90% students of color) are presented. Promotion of scientific literacy, critical thinking, and communication skills was the goal of the integrated program.

int, lit, sks, cur, ref (HS)

Lesgold, Alan; Feuer, Michael J.; Black, Allison M. (Eds.). (1997). ***Transitions in work and learning: Implications for assessment.*** Washington, DC: Board on Testing and Assessment, National Research Council, National Academy Press [Available online]. Retrieved October 9, 1998 from the World Wide Web. [http://www.nap.edu/search/index.html]

In this book, researchers address the mismatch between skill requirements of the workplaces and the skills acquired by students in school, the validity of existing assessment technologies, and ethical and legal issues in the implementation of new testing and certification programs.

sks, car, asm, kns (GEN)

Lokan, Jan; Ford, Phoebe; Greenwood, Lisa. (1997). ***Maths and science on the line: Australian middle primary students' performance in the Third International Mathematics and Science Study.*** Melbourne, Victoria: Australian Council for Educational Research. [SE 060 752]

The contents of the report include: the introduction, international results, results within Australia, achievement in the mathematics content areas, achievement in the science content areas, performance assessment and performance expectations, curriculum factors, teachers and schools, and policy perspectives.

ach, cur, cul, ref (K-12)

Lowery, Lawrence F. (1997). ***NSTA pathways to the science standards: Guidelines for moving the vision into practice. Elementary school edition.*** Arlington, VA: National Science Teachers Association. [SE 060 463]

This book includes a general discussion about the learning capabilities of students in various grade levels followed by discussions of selected content areas with practical suggestions, including assessment options, for bringing the specific content area into the classroom. Vignettes are presented as examples of how some of the Standards might be implemented using a variety of approaches adaptable to many different settings.

lrg, ped, ref, tpd (EL)

Marek, Edmund A.; Cavallo, Ann M. L. (1997). ***The learning cycle: Elementary school science and beyond, revised edition.*** Portsmouth, NJ: Heinemann. [SE 060 280]

This book is about the learning cycle that moves children through a scientific investigation by allowing them first to explore materials, then to construct a concept, and finally to apply this concept to new ideas. It includes integrated learning cycles and learning cycles across the disciplines and the uses of various questioning strategies, alternative evaluation schemes, and modern technologies.

lth, ped, ref, tpd (EL)

Mashhadi, Azam. (1997). ***Figurative thinking and the nature of physics.*** Paper presented at the Annual International Conference on Thinking (7th, Singapore, June 1-6, 1997). [SE 061 022]

Physicists have created a language in which the fundamental components and symmetries of the world cannot be observed; it has to be made intelligible using figurative language-analogy and metaphor. Following an analysis of the nature of metaphors, analogies and models some results of an empirical investigation of students' conceptions of figurative language are described.

cid, rem, kns, phe, phy (GEN)

Mashhadi, Azam; Han, Christine. (1997). ***21st century thinking and science education.*** Paper presented at the Annual International Conference on Thinking (7th, Singapore, June 1-6, 1997). [SE 061 021]

Science teaching has a major role in molding students' world views by providing concepts that impose some meaning on the world. Science education should speed up the rate of diffusion of current scientific insights about the nature of reality.

phe, cur (GEN)

Mashhadi, Azam; Woolnough, Brian. (1997). ***Dualistic thinking underlying students' understanding of quantum physics.*** Paper presented at the Annual International Conference on Thinking (7th, Singapore, June 1-6, 1997). [SE 061 020]

The relationships between students' conceptions (at the level of the population group) of quantum phenomena are investigated using a structured questionnaire and multivariate analytical techniques. A novel quantitative methodology is used to probe students' qualitative implicit understanding. The findings confirm the primacy of dualism in students' thinking.

alf, phe, phy, kns (K-12)

McNeely, Margaret E. (Ed.); et al. (1997). ***Guidebook To Examine School Curricula.*** Washington, DC: Office of Educational Research and Improvement. [SE 060 943]

The *Guidebook* sets forth five different methods of analyzing curricula. Methods vary in their depth of analysis; the time/resources necessary; their potential uses; the type of information/conclusions that can be obtained; and in their focus on the needs of diverse learners.

cur, asm, eqt (K-12)

Miller-Whitehead, Marie. (1997). ***An analysis of science scale scores for grades 2-8 in Tennessee for 1990-1994.*** U.S.: Alabama. [SE 060 722]

This research intends to answer the following questions: is there evidence of more equity and value-added in student scores?; was variability in scores decreasing?; how do scores compare across years and grade levels?; and, what are the implications for curriculum and assessment reforms? The null hypothesis of the investigation was that there is no difference in science scale scores across years or grade levels.

ach, eqt, asm, cur (EL)

Miller-Whitehead, Marie. (1997). ***A longitudinal analysis of science scale scores grades 2-8 in Tennessee for 1992-1996.*** U.S.: Alabama. [SE 060 860]

This is a follow-up to an earlier study conducted using state of Tennessee data for student scale scores in science for the years 1990-4 revealing an increase in the mean of science scale scores for grades 2-8 each year. This population represents the remaining members of the 1991 student cohort. The finding seems to indicate that teacher effect on student achievement may be both cumulative and residual.

ach, ref (EL)

Miller-Whitehead, Marie. (1997). ***Tennessee TCAP science scale scores 1990-1997: Implications for continuous improvement and educational reform.*** U.S.: Alabama. [SE 061 058]

The research goal is to determine the impact of standardized science test scores on student's continuous achievement. The data show a dip in grade 4 but an overall increase in scores. Data are displayed in tables for minimum/maximum science scale scores, mean/five year mean science scale scores, science scale score descriptives, and analysis of variance.

ach, ref, ped, cur (EL)

Mullis, Ina V. S. (1997). ***Benchmarking to international achievement.*** Washington, DC: Office of Educational Research and Improvement. [SE 060 939]

By highlighting some of the eighth-grade findings from TIMSS, this booklet aims to help readers better understand how TIMSS can serve as a tool for education reform. Policymakers and educators can compare the findings of TIMSS with local student performance and educational practices in order to facilitate reform initiatives.

cul, ach, ref, cur, ped, lit (MS)

Murphy, Anthony P.; Coppola, Ralph K. (1997). ***GLOBE: A science/education partnership program.*** Paper presented at the Annual Meeting of the American Educational Research Association (Chicago, IL, March, 1997). [SE 060 609]

GLOBE engages K-12 students and scientists in collecting and analyzing data and is truly a partnership between science and education. The nature of this partnership is reflected in the various research protocols and learning activities for each grade level and in the fact that the science processes used by researchers are reflections of the inquiry processes used at the K-12 or equivalent level.

ntw, res, inq, pbs, sks (K-12)

National Alliance of Business. (1997). ***Achieving world class standards in math and science. Workforce economics trends; June 1997.*** Washington, DC: Author. [SE 060 779]

This issue examines the perspectives on some of the factors that are important in influencing fourth and eighth grade students' achievement in math and science, and includes graphics and tables presenting some results of TIMSS comparing the status of U.S. students with those of other countries.

ach, cul, ref (EL, MS)

National Assessment Governing Board. (1997). ***What do students know? 1996 NAEP science results for 4th, 8th, and 12th Graders.*** Washington, DC: Author. [SE 061 016]

Results of the 1996 NAEP Science Assessment for grades 4, 8, and 12 are presented through graphs and examples of test questions with student answers. Student performance is measured against standards set by the NAEP governing board. Test data are combined and reported on the national and state level.

ach, kns (K-12)

National Center for Education Statistics. (1997). ***Attaining excellence: A TIMSS resource kit.*** Washington, DC: Author. [SE 060 930]

This kit consists of multimedia resources including reports on TIMSS research findings, videotapes of classroom teaching, discussion guides, presentation overhead masters, checklists, leaflets and flyers.

ach, cul, ped, cur, tpd (K-12)

National Center for Education Statistics. (1997). ***Pursuing excellence: Eighth-grade findings from the Third International Math and Science Study. A video presentation*** [Videotape]. Washington, DC: Author. [SE 060 446]

The video highlights the findings from assessing the math and science performance of over 500,000 students in 41 countries at three different grade levels. It summarizes the study's key findings at the eighth-grade level, and includes the views of business leaders, policy makers, educators, and researchers on the study's implications for America's schools. The video summarizes the findings of the TIMSS study with respect to four topics: curriculum and learning expectations, teaching, teachers' and students' lives.

ach, cul, cur, bkg, tpd (K-12, TE)

National Education Goals Panel. (1997). ***The National Education Goals report: Building a nation of learners 1997.*** Washington, DC: Author. [SE 060 986]

This report highlights student achievement in mathematics and science. After data comparisons of grades 4, 8, and 12 student scores to those in Korea and Singapore, the NEGP proposes three steps to raise achievement levels: set tougher standards that are comparable to the world's best, align all components of the education system with the standards; and strengthen our teachers' subject matter knowledge and teaching skills.

ach, ref, tpd, cul, skt, knt (K-12)

National Education Goals Panel. (1997). ***The National Education Goals report summary 1997: Mathematics and science achievement for the 21st century.*** Washington, DC: Author. [SE 060 945]

The purpose of this annual report to the nation is to capture the attention of Americans in order to better our schools and increase our expectations for student performance. More than two dozen national core indicators are presented which convey how much progress has been made in each Goal area. This year's highlights include student achievement in mathematics and science, two of the core academic subjects in which we expect all students to demonstrate competency.

ref, ach (K-12)

National Research Council. (1997). ***Introducing the National Science Education Standards.*** Washington, DC: Author. [SE 060 097]

This pamphlet outlines the National Science Education Standards which are the guidelines that define the science content that all students should know and be able to do and which also provide guidelines for assessment of student understanding of the content.

ref, cur, asm, tpd, ped (ALL, TE, GEN)

National Research Council. (1997). ***Science teacher preparation in an era of standards-based reform.*** Washington, DC: National Academy Press [Available online]. Retrieved October 9, 1998 from the World Wide Web. [http://www.nap.edu/readingroom/books/stp]

This report offers a vision of what science teacher preparation will look like in a standards-based program, and then recommends ways in which the National Science Foundation (NSF) can mobilize the postsecondary education community to achieve these goals.

ref, tpd (TE)

National Science Foundation. (1997). ***The challenge and promise of K-8 science education reform. Foundations: A monograph for professionals in science, mathematics and technology education.*** Arlington, VA: Author. [SE 060 139]

This volume examines opportunities and challenges for those at the front line of science education in elementary and middle schools. It is a resource for teachers and administrators who have not yet implemented a program of inquiry-based science education.

inq, ref (EL)

National Science Foundation. (1997). ***Characteristics of doctoral scientists and engineers in the United States: 1995.*** Arlington, VA: Author. [SE 061 019]

This report presents data on the demographic and employment characteristics of the nation's doctoral scientists and engineers. The population includes persons under the age 76 holding doctorates from U.S. institutions. It includes detailed statistical tables, technical notes, and the survey instrument.

car, chs (PS)

National Science Foundation. (1997). ***Characteristics of recent science and engineering graduates: 1993.*** Arlington, VA: Author. [SE 059 887]

This report presents data on the characteristics of men and women who received a bachelor's or master's degree in a science or engineering field from U.S. academic institutions during the 1990/91 and 1991/92 academic years. The data were collected in 1993 and reflect the status of individuals as of April of that year.

chs, car (PS)

National Science Foundation. (1997). ***Course and curriculum development 1995 awards. Course and curriculum development.*** Arlington, VA: Author. [SE 060 153]

This program seeks to encourage a greater number of talented faculty to devote creative energy to improve learning by undergraduates in the nation's classrooms and laboratories. The award winning projects were selected for their creativity, scientific and educational quality, and potential for utility at multiple institutions and national impact.

ref, ped, cur, tpd (PS, TE)

National Science Foundation. (1997). ***Science and engineering doctorate awards: 1996.*** Arlington, VA: Author. [SE 061 082]

The Survey of Earned Doctorates (SED) has been conducted annually for the National Research

Council. The data presented in this report show trends in doctorate awards by science and engineering field and recipient characteristics, institutions awarding doctorates, and postgraduation plans of recipients for the years 1987-1996. Data for the SED are collected from the individual doctorate recipients.

car, chs (PS)

National Science Teachers Association. (1997). ***Block scheduling: Teaching strategies for the restructured school day.*** Arlington, VA: Author. [SE 060 468]

This is a compilation of articles from *The Science Teacher* that pertain to block scheduling and strategies for effective science instruction within this framework. Also included are a forward and an introduction that relate this new approach to current goals and standards for science education.

ped, tpd, ref (SE)

North Carolina State Department of Public Instruction. (1997). ***1996 NAEP report for North Carolina eighth grade science.*** Raleigh, NC: Author. [SE 060 750]

This report describes science performance for eighth graders in NC, compares the results for various groups of students, and examines the results for individual demographic groups and for individual background questions. Sections provide information about: what was assessed, who was sampled, and how the results are reported; the distribution of science scale score results; student results of the hands-on tasks; and contextual information about school characteristics, instruction, and home support.

ach, chs, hos, bkg (MS)

Nous, Albert P. (1997). ***Imaging and visualization in science education.*** Paper presented at a Regional Conference of the National Science Teachers Association (Pittsburgh, PA, October 31, 1997). [SE 060 949]

This paper calls for a collaboration for imaging and visualization. It also presents information about involved organizations and technology related to imaging and visualization in science. Educational implications from imaging and visualization at NASA and retrofitting the curriculum to match scientific technology advances are discussed.

rem, tec, ntw, ped, cur, tpd (K-12)

Office of Educational Research and Improvement. (1997). ***Introduction to TIMSS: The Third International Mathematics and Science Study.*** Washington, DC: Author. [SE 060 938]

The 1995-1996 TIMSS is the largest and most comprehensive international study ever conducted. This overview helps educators and others in states, communities, and schools to use TIMSS as a starting point. It provides an overview of the TIMSS study, key findings and conclusions from the eighth and fourth grade reports, and supporting materials to help communities and states use TIMSS to examine their own practices from an international perspective.

ach, cul, ped, cur, lit (K-12)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Alabama. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 786]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Alabama, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Alaska. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 787]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Alaska, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Arizona. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 788]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Arizona, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Arkansas. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 789]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Arkansas, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for California. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 790]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in California, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report form Colorado. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 791]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Colorado, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Connecticut. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 792]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Connecticut, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Delaware. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 793]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Delaware, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Department of Defense Dependent Schools. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 794]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in DoDDS, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Department of Defense Dependents Schools grade 4. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 061 017]

This report, drawn from the 1996 NAEP, describes science performance for fourth graders in the DoDDS, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions.

ach, chs, bkg (EL)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Department of Defense Domestic Dependent Elementary and Secondary Schools. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 795]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in DDESS, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Department of Defense Domestic Dependent Elementary and Secondary Schools grade 4. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 061 018]

This report, drawn from the 1996 NAEP, describes science performance for fourth graders in the DDESS, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions.

ach, chs, bkg (EL)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for District of Columbia. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 796]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in the District of Columbia, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Florida. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 797]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Florida, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Georgia. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 798]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Georgia, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Guam. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 799]

This report, drawn from the 1996 NAEP describes science performance for eighth graders in Guam, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Hawaii. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 800]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Hawaii, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Indiana. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 801]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Indiana, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Iowa. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 802]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Iowa, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Kentucky. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 803]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Kentucky, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Louisiana. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 804]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Louisiana, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Maine. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 805]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Maine, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Maryland. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 806]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Maryland, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Massachusetts. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 807]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Massachusetts, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Michigan. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 808]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Michigan, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Minnesota. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 809]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Minnesota, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Mississippi. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 810]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Mississippi, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Missouri. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 811]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Missouri, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Montana. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 812]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Montana, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Nebraska. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 813]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Nebraska, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Nevada. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 814]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Nevada, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for New Hampshire. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 815]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in New Hampshire, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for New Mexico. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 816]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in New Mexico, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for New York. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 817]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in New York, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for North Carolina. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 818]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in North Carolina, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for North Dakota. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 819]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in North Dakota, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Oregon. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 820]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Oregon, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Rhode Island. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 821]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Rhode Island, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for South Carolina. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 822]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in South Carolina, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). **NAEP 1996 science state report for Tennessee. Findings from the National Assessment of Educational Progress.** Washington, DC: National Center for Education Statistics. [SE 060 823]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Tennessee, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Texas. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 824]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Texas, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Utah. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 825]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Utah, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Vermont. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 826]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Vermont, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Virginia. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 827]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Virginia, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Washington. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 828]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Washington, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for West Virginia. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 829]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in West Virginia, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Wisconsin. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 830]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Wisconsin, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

O'Sullivan, Christine Y.; Jerry, Laura; Ballator, Nada; Herr, Fiona. (1997). ***NAEP 1996 science state report for Wyoming. Findings from the National Assessment of Educational Progress.*** Washington, DC: National Center for Education Statistics. [SE 060 831]

This report, drawn from the 1996 NAEP, describes science performance for eighth graders in Wyoming, compares the results for various groups of students within that population, and examines the results for individual demographic groups and for individual background questions. Four appendices are also provided which contain information about the reporting of the 1996 NAEP science results; the format of the assessment instrument; and teacher preparation.

ach, chs, bkg, asm, tpd (MS)

Ponzio, Richard C.; Peterson, Kenneth D. (1997). ***Adolescents as effective teachers of child science.*** Paper presented at the Annual Meeting of the Northern Rocky Mountain Educational Research Association (15th, Jackson, WY, October 3, 1997). [SE 060 900]

The purpose of this study of the 4-H Youth Experiences in Science Project is to illuminate the interactions and other dynamics of adolescents as teachers in a science curriculum that was planned to use the teens as primary instructional source teachers, rather than merely as tutors. This study found that the nature of child science (the instructional goal) was particularly well suited to the instructional strengths of teenagers.

ntw, nfd, ped, sks (EL, HS)

Project Kaleidoscope. (1997). ***The question of reform: Report on Project Kaleidoscope 1996-1997.*** Washington, DC: Author. [SE 060 537]

Over the past decade, undergraduate colleges and universities of all sizes in all parts of the country, public and private, have begun to pursue reform for the sciences and mathematics. The report is a distillation of questions that successful reformers have asked, including the key sets of questions which institutions successful in conceiving, implementing and sustaining reform have addressed.

ref (PS)

Raizen, Senta A. (1997). ***Standards for science education. NISE Research Monographs.*** Madison WI: Wisconsin Center for Educational Research. Retrieved October 1, 1998 from the World Wide Web. [http://www.wcer.wisc.edu/NISE/Publications/Occasional_Papers/OP1-Standards4Science_Educ.html]

This paper contains a comparative analysis of publications developed by the NSTA, AAAS, and NRC that provide national standards for science education. Topics include assessment, state science curriculum frameworks, and policy issues.

ref, asm, cur, lit (K-12)

Rediscovering Geography Committee, National Research Council. (1997). ***Rediscovering geography: New relevance for science and society.*** Washington, DC: National Academy Press [Available online]. Retrieved October 9, 1998 from the World Wide Web. [http://www.nap.edu/readingroom/books/geo]

Through highlighted case studies, this book illustrates geography's impact on environmental change, population growth, information infrastructure, the condition of cities, and the spread of AIDS. It also examines tools for data collection, analysis, and display.

esg, sts, res (K-12)

Regets, Mark. (1997). ***What's happening in the labor market for recent science and engineering Ph.D. recipients?*** Arlington, VA: National Science Foundation. [SE 060 872]

Labor market conditions for science and engineering Ph.D. recipients changed slightly between April 1993 and 1995. Data is used from the 1993 and 1995 Survey of Ph.D. recipients, a biennial NSF survey of holders of Ph.D.s from U.S. institutions up to age 75. Included are: unemployment rates; involuntarily working outside of field; tenure track positions; and salaries.

car, chs (PS)

Rodriguez, Alberto J. (1997). ***Counting the runners who don't have shoes: Trends in student achievement in science by socioeconomic status and gender within ethnic groups. NISE Occasional Papers.*** Madison WI: Wisconsin Center for Educational Research. Retrieved October 1, 1998 from the World Wide Web. [http://www.wcer.wisc.edu/NISE/Publications/Research_Monographs/Rm3-Counting_the_Runners.html]

This results of this meta-analysis indicate that there has been some improvement in the achievement of traditionally underserved students. By understanding the students' point of view, educators can identify factors that influence success and design effective intervention programs.

ach, eqt, gen, eth, ped (K-12)

Rubba, Peter A. (Ed.); et al. (1997). ***Proceedings of the 1997 Annual International Conference of the Association for the Education of Teachers in Science.*** PA: Association for the Education of Teachers in Science. [SE 060 318]

These proceedings of the 1997 Annual International Conference of the Association for the Education of Teachers in Science (AETS) include a copy of the conference program and 43 papers and presentation summaries from the meeting, ordered by conference session.

res (ALL)

Schau, Candace; et al. (1997). ***Use of fill-in concept maps to assess middle school students' connected understanding of science.*** Paper presented at the Annual Meeting of the American Education Research Association (Chicago, IL, March 1997). [SE 060 340]

This paper is based on the belief that knowledge must be organized in order to be accessible from long term memory and this kind of organization requires connected understanding. Findings indicate that the select-and-fill-in concept map format can be used with ethnically diverse middle school students to measure their connected understanding of science.

kns, asm, eth, lth (MS)

Scottish Office Education and Industry Department. (1997). ***Achievements of primary 4 and primary 5 pupils in mathematics and science.*** Edinburgh, Scotland: Author. [SE 060 553]

This document reports on the performance of Scottish primary students in mathematics and science. Students scored below the international average in mathematics and are ranked in the lower half of the range of countries involved in the study. In science, students scored above the international average and are ranked in the middle.

ach, cul (EL)

Springer, Leonard; Stanne, Mary E.; Donovan, Samuel S. (1997). ***Effects of small-group learning on undergraduates in science, mathematics, engineering, and technology: A meta-analysis. NISE Research Monographs.*** Madison WI: Wisconsin Center for Educational Research. Retrieved October 1, 1998 from the World Wide Web. [http://www.wcer.wisc.edu/NISE/Publications/Research_Monographs/index.html]

This meta-analysis demonstrates that various forms of small-group learning are effective in promoting greater academic achievement, more favorable attitudes toward learning, and increased persistence through science, math, engineering and technology courses and programs.

cpl, ach, ats (PS)

Stepanek, Jennifer. (1997). ***Science and mathematics standards in the classroom: It's just good teaching.*** Portland, OR: Northwest Regional Educational Laboratory. [SE 060 766]

Although the standards are not new, they have not been fully implemented and there are many indications that teachers need more information about them. This publication summarizes the vision and rational presented in the national standards documents and current literature on the topic. Strategies and resources for implementing a standards-based teaching approach are the main focus of this report.

ref, ped (K-12, TE)

Stepanek, Jennifer; Jarrett, Denise. (1997). ***Assessment strategies to inform science and mathematics instruction: It's just good teaching.*** Portland, OR: Northwest Regional Educational Laboratory. [SE 061 102]

Changes in assessment practices are central to ongoing reform efforts in science and mathematics education. This document includes a summary of the research and current literature on the topic, a discussion of effective strategies, and an annotated listing of organizations and resources, both print and electronic.

ref, asm (K-12)

Summers, Mike; Kruger, Colin; Mant, Jenny. (1997). ***Teaching electricity effectively: A research-based guide for primary science.*** Herts, England: Association for Science Education. [SE 060 713]

The book is based on in-depth case studies of the teaching of electricity by three primary school teachers in which children's understanding was investigated before and after teaching. The research identified a set of electricity concepts that can be acquired readily by primary school teachers and taught effectively to children. The research also indicated numerous ways in which teachers can develop children's ideas successfully and some of the pitfalls to be avoided.

ccg, knt, ped, alf (EL, TE)

Texley, Juliana; Wild, Ann. (1997). ***NSTA pathways to the science standards: Guidelines for moving the vision into practice. High school edition.*** Arlington, VA: National Science Teachers Association. [SE 060 464]

This book is designed for high school teachers and includes tools to guide teaching, professional development, assessment, program and curriculum, and interactions with the education system toward the vision of the National Science Education Standards. Examples of inquiry, science and technology, personal and social perspectives, and history and nature of science are included.

ref, tpd, ped, asm, cur (TE, HS)

Tobias, Sheila. (1997). ***Some recent developments in teacher education in mathematics and science: A review and commentary. NISE Occasional Papers.*** Madison WI: Wisconsin Center for Educational Research. Retrieved October 1, 1998 from the World Wide Web. [http://www.wcer.wisc.edu/NISE/Publications/Occasional_Papers/OP4-Recent_Developments.html]

This literature review of teacher education compares the relationships between mathematics and science education with respect to the math and science departments. The author recommends including pedagogy and content in teaching methods courses.

tpd, ped, cur (TE)

Tobias, Sheila; Raphael, Jacqueline. (1997). ***The hidden curriculum— Faculty-made tests in science. Part 1: Lower-division courses.*** New York: Plenum Press. [SE 060 762]

Exemplary innovations in exam practices that assess scientific understanding in new and more appropriate ways are detailed in this book. The research described and the resulting hundreds of best exam practices in all science courses at the college level is a much needed resource for every science educator and administrator.

asm (PS)

Tobias, Sheila; Raphael, Jacqueline. (1997). ***The hidden curriculum— Faculty-made tests in science. Part 2: Upper-division courses.*** New York: Plenum Press. [SE 060 763]

This volume is premised on the belief that testing practices influence educational procedures and learning outcomes. Exemplary innovations in exam practices that assess scientific understanding in new and more appropriate ways are detailed in this book. The research and resulting compendium of exam practices in graduate level science courses is a much needed resource for science educators and administrators.

asm (PS)

University of North Carolina Mathematics and Science Education Network. (1997). ***MSEN long-range goals.*** Chapel Hill, NC: Author. [SE 059 984]

MSEN applies the resources of UNC to strengthen mathematics and science education in schools throughout the state. The faculty direct center operations and provide K-12 teachers with professional development offerings by bringing them into contact with university faculty, scientists, and other professionals, and exposing them to the current educational research.

ntw, tpd (ALL)

University of North Carolina Mathematics and Science Education Network. (1997). ***A shared vision for mathematics and science education in North Carolina.*** Chapel Hill, NC: Author. [SE 059 992]

The North Carolina Mathematics and Science Coalition is an organization of education, public policy, civic, community, and business leaders working to stimulate and promote efforts to implement systemic reforms in mathematics and science education. The purpose is to focus the efforts of diverse groups of stakeholders working together to bring excellence to mathematics and science education.

ntw, ref (ALL)

Wagner, Elaine. (1997). ***Environmental attitudes in the elementary grades: A bibliographic essay.*** U.S.: Georgia. [SE 060 557]

Ecological or environmental programs integrated into science courses in the elementary grades can make children aware that they can have either a positive or negative effect on their environment. This bibliography was compiled from articles and dissertations on environmental education and children's awareness, attitudes, and perceptions toward the natural environment.

ats, ene, res (EL)

Wallace, Raven; Kupperman, Jeff. (1997). ***On-line search in the science classroom: Benefits and possibilities.*** Paper presented at the Annual Meeting of the American Educational Research Association (Chicago, IL, March 24-28, 1997). [SE 060 160]

This study addresses some basic questions about students' strategies for seeking and using information from the World Wide Web. From the results, it is clear that the students are not engaged and thoughtful by virtue of being on-line. The students are constrained and this may be connected to their consistent reduction of the task to finding an answer or a perfect source.

sks, edt, kns (K-12)

Webb, Norman L. (1997). ***Criteria for alignment of expectations and assessments in mathematics and science education. NISE Research Monographs.*** Madison WI: Wisconsin Center for Educational Research. Retrieved October 1, 1998 from the World Wide Web. [http://www.wcer.wisc.edu/NISE/Research_Monographs/RM6-Criteria_for_Alignment.html]

This monograph identifies criteria for judging the alignment between expectations and assessments central to current efforts of systemic and standards-based education reforms in mathematics and science.

ref, asm, cur (K-12)

Webb, Norman L. (1997). ***Determining alignment of expectations and assessments in mathematics and science education. NISE Briefs, 1(2).*** Madison WI: Wisconsin Center for Educational Research. Retrieved October 1, 1998 from the World Wide Web. [http://www.wcer.wisc.edu/NISE/Publications/Briefs/Vol_1_No_2]

This research brief, intended for those who seek to improve student learning by creating coherent systems of expectations and assessments in states and districts, examines the concept of alignment and is required for expectations and assessments to be in alignment.

ref, asm, cur (K-12)

Weiss, Iris R. (1997). ***The status of science and mathematics teaching in the United States: Comparing teacher views and classroom practice to national standards. NISE Briefs, 1(3).*** Madison WI: Wisconsin Center for Educational Research. Retrieved October 1, 1998 from the World Wide Web. [http://www.wcer.wisc.edu/NISE/Publications/Briefs/Vol_1_No_3]

This research brief reports the results of a 1993 survey that compared teacher's classroom practice to the national standards for math and science education. Instructional issues include: time spent on these subjects, classroom activities, and the context for science and math teaching.

ref, ped, tpd (K-12)

Whitin, Phyllis; Whitin, David J. (1997). ***Inquiry at the window: Pursuing the wonders of learners.*** Portsmouth, NH: Heinemann. [SE 059 702]

This book is about inquiry learning during a year-long classroom exploration with 4th graders who set up a bird feeder and recorded observations in a journal. The role of teachers should be to highlight problems that learners encounter and to support them in devising appropriate strategies and possible solutions to problems.

inq, ped, pbs (EL, TE)

Williams, Julian. (1997). ***Scientific dialogue as evidence of learning.*** Paper presented at the Annual Meeting of the American Educational Research Association (Chicago, IL, March, 1997). [SE 060 857]

This paper looks at the evidence of learning in children engaged in small-group discussion with a teacher. Motives of the participants in this dialogue are analyzed, and the teaching-learning process is considered to be the resolution of productive misunderstandings between everyday notions and scientific notions. The concluding discussion draws implications and raises questions about the role of the teacher in scientific dialogue.

cid, lrg (EL)

Yore, Larry D. (1997). ***Leadership interns in undergraduate elementary school science education programs.*** Paper presented at the Annual Meeting of the School Science and Mathematics Association (Milwaukee, WI, November 13-15, 1997). [SE 061 013]

This action research focus was the teaching internship in science. The internship's effectiveness was documented with program's artifacts: interns' unit /lesson plans, class hand-outs; professors' journal notes; classroom observations; school principal/classroom teacher comments; and course evaluations. Qualitative analyses revealed the positive and negative aspects of this internship.

tpd, ntw (TE)

Index

Every dissertation, journal article, conference paper, monograph, and electronic document listed in the preceding three sections has been categorized by one to three major codes. Each publication is indexed here according to the major codes, and the complete set of *major* codes for each publication is listed after each entry.

Achievement (ach)

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Brown, E. ach, ped, gen
Chien, C. cbi, ach, cns
Cundiff, K. ach, cbi, phy
Dundis, S. edt, lrg, ach
Foster, J. ach, ped, int
Gavin, A. int, ach
Glenn, J. che, ach, lrg
Gray, D. res, ach, cur
Hall, L. ach, bfs, ats
Hamilton, L. asm, gen, ach
Havasy, R. nfd, ach, ats
Heron, L. cns, ats, ach
Hill, G. P. eth, tec, ach
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Maslin, L. ach, lrg
McFate, C. ach, asm, che
Miller, R. ach, chs
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Renaud, C. cbi, ach, bkg
Richardson, W. cbi, ach, ats
Schuen, D. ach, int, cur
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Talluto, M. bio, cbi, ach
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Harwood & McMahon edt, ats, ach
Lu et al. cbi, ach, ats
Morrow et al. int, ach, ats
Van Lanen & Lockie ped, ats, ach
Wang & Staver gen, ach, eqt

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Miller-Whitehead, M. ach
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Mullis, I. cul, ach, ref
Nat'l. Alliance of Business ach, cul
Nat'l. Assessment Governing Bd. ach, kns
Nat'l. Center for Educ. Statistics ach, cul
Nat'l. Center for Educ. Statistics ach, cul
Nat'l. Educ. Goals Panel ach, ref, tpd
Nat'l. Educ. Goals Panel ref, ach
North Carolina State Dept. of Public Instr. ach, chs
Office of Educ'l. Research and Improvement ach, cul
O'Sullivan, Jerry, Ballator & Herr [48 ENTRIES] ach, chs, bkg
Rodriguez, A. ach, eqt
Scottish Office Educ. and Industry Dept. ach, cul
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Alternative Frameworks (alf)

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Griffin, L. phy, alf, cht
Krylova, I. alf, che, kns
MacGowan, C. alf, pbs, che
Patron, F. alf, kns, che
Pride, T. alf, phy, cur
Sheppard, K. alf, ccg, che
Swan, R. alf, cbi, ccg
Thomas, P. alf, che

Articles
Atwood & Atwood alf, knt, ccg
Fleer, M. eth, alf, kns
Haidar, A. alf, knt, che
Hatzinikita & Koulaidis kns, alf, phy
Marques & Thompson alf, evo
Palmer & Flanagan alf, ccg
Preece, P. alf, knt, phy
Schmidt, H. alf, che, lit
Smith et al. alf, ped, ccg
Tamir, P. alf, kns, res

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Mashhadi & Woolnough alf, phe, phy

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Hamilton, L. asm, gen, ach
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Kujawinski, D. sks, asm, lab
Lawrence, M. asm, sks, phy
McBeth, W. ene, asm, kns
McFate, C. ach, asm, che
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Nevala, A. ene, asm
Newsom, M. asm, ats
Pearson, R. asm, nfd
Sivalingam-Nethi, V. asm, ats, bfs
Tonnis, D. asm, bft, ped
Wood, B. tpd, asm
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Johanson, G. ats, asm
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Orion et al.	fsd, asm
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Raizen, S.	ref, asm, cur
Schau et al.	kns, asm
Stepanek & Jarrett	ref, asm
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Tobias & Raphael	asm
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Webb, N.	ref, asm, cur

Student Attitudes (ats)

Dissertations

Adams, A.	cns, ats, ccg
Alao, S.	kns, ene, ats
Allen, D.	edt, ach, ats
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Anderson, C.	ped, ats
Chung, P.	ats, che, ped
Clark, S.	cbi, edt, ats
Cole, K.	mce, hos, ats
Curtis, K.	ped, ats
Dallal, K.	ped, ats, cns
De Laney, T.	gen, ene, ats
Dieck, P.	int, ats, mat
Doster, E.	ats, bfs, lab
Dube, A.	ats, car, tec
Escalada, L.	ped, cur, ats
Filippelli, L.	gen, car, ats
Freund, J.	mce, fsd, ats
Gable, D.	gen, car, ats
George, R.	ats, nas
Gillespie, K.	ats, kns, nfd
Hall, L.	ach, bfs, ats
Harding, J.	lrg, ats, ene
Hariharan, J.	ats, cur, ped
Havasy, R.	nfd, ach, ats
Heron, L.	cns, ats, ach
Huong, T.	kns, phy, ats
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Keller, B.	ped, ach, ats
Killebrew, C.	cur, ats, lrg
Kosten, L.	bkg, nfd, ats
Longo, E.	bkg, ats, bfs
Luckett, P.	tec, ats
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Nodurft, S.	fsd, ats
Orcutt, J.	inq, ats, ach
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Parsons, B.	ats, sts, gen
Richardson, W.	cbi, ach, ats
Runge, A.	edt, ats, phy
Sivalingam-Nethi, V.	asm, ats, bfs
Surbrook, N.	ene, ats, fsd
Tingley, P.	ach, ats, gen
Vasquez, D.	cbi, lrg, ats
Volz, N.	gen, ats, ach
Wallace, S.	inq, ach, ats
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Chiam & Zoller	asm, ats, att
Cobern, W.	lth, ats
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Freedman, M.	hos, ats, ach
Greenfield, T.	gen, nas, ats
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Harwood & McMahon	edt, ats, ach
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Moore & Foy	ats, asm
Morrow et al.	int, ach, ats
Neathery, M.	ats, chs, sks
Pole et al.	ats, car, ntw
Polzella, L.	chs, hos, ats
Sitman et al.	ped, ats, att
Slater, T.	asm, lrg, ats
Tunnicliffe, S.	ats, bio, cur
Van Lanen & Lockie	ped, ats, ach
Woolnough, B.	ats, bkg
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Bayer Corporation	ats, bfs
Springer, Stanne & Donovan	cpl, ach, ats
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Al-Momani, I.	tpd, cns, att
Aldrich, L.	att, tpd
Cho, H.	att, bft, tpd
D'Agincourt, L.	tpd, knt, att
Ford, B.	att, bft, bkg
Hildreth, D.	att, bft, skt
Horton, N.	tpd, att
Kizito, R.	edt, att
Lawlor-Lopez, E.	att, tpd, mat
Marco, P.	att, ene, mat
May, T.	ene, att, bft
McCauley, E.	att, bft, tec
Ngongbo, L.	sts, att, tpd
White, M.	ntw, att, ats

Articles

Adams & Krockover	att, bft, tpd
Bruce et al.	ntw, ats, att
Caseau & Norman	sts, ats, att
Chiam & Zoller	asm, ats, att
Dickinson et al.	att, ntw, tpd
Ginsberg, E.	att, mat, ped
Kumar, D.	att, ref
Parker, J.	tpd, att
Scharmann et al.	sts, tpd, att
Sitman et al.	ped, ats, att
Zuckerman, J.	att, tpd

Student Beliefs (bfs)

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Armstrong, K.	bio, lth, bfs
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Hall, L.	ach, bfs, ats
Howes, E.	bfs, ref, phe
Jelinek, D.	bfs, ats, nas
Keefer, R.	bfs, lab, lrg
Langmaid, K.	bfs, ene
Longo, E.	bkg, ats, bfs
Miller, J.	bfs, ene, bkg
Morgan, P.	bfs, ach, che
Rymer, J.	res, bfs, ref
Sivalingam-Nethi, V.	asm, ats, bfs
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Chinn & Iding	bfs, bkg, gen
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Ford, B. att, bft, bkg
Freedman, R. bft, asm, cns
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Hildreth, D. att, bft, skt
Hsueh, T. bft, nas
Mattson, S. bft, ntw, cur
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Meyer, K. bft, ped
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Thurmond, C. bft, lit
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Varrella, G. bft, ped
Wilder, M. bft, lit, ref
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Adams & Krockover tpd, knt, bft
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Huinker & Madison bft, tpd
Jetton & Alexander bft, bfs, cid
Mellado, V. nas, ped, bft
Palmquist & Finley bft, nas, ccg
Robinson et al. bfs, bft, sts
Rye & Dana sts, bft, ped
Swann & Brown cur, bft
Weiss, I. ref, ped, bft
Wilkinson & Ward lab, bfs, bft
Wubbels & Brekelmans bfs, bft, phy
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Harlan, R. bkg, cur, bio
Hill, G. D. ccg, bio
Kim, N. cbi, bio, lrg
Krusenklaus, H. asm, cur, bio
Lee, C. bio, lab, cur
Neiswonger, H. cur, bio, ped
Poole, B. ach, bkg, bio
Scheidemantel, D. cur, bio
Sharman, S. lth, chs, bio
Shepherd, L. bio, ach
Talluto, M. bio, cbi, ach

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Flannery, M. res, bio
Haiqi, Z. mat, bio, res
Mazzoni et al. cur, ped, bio
Tunnicliffe, S. ats, bio, cur

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Ford, B. att, bft, bkg
Griffin, G. pbs, eth, bkg
Harlan, R. bkg, cur, bio
Kosten, L. bkg, nfd, ats
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Cannon, J. bkg, ped, cns
Chinn & Iding bfs, bkg, gen
Erinosho, S. gen, ats, bkg
Erinosho, S. gen, car, bkg
Fisher & Waldrip mce, bkg, asm
Granados & Callanan eth, bkg, sks
Powell, R. bkg, knt
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Erinosho, S. gen, car, bkg
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Kim, N.	cbi, bio, lrg
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Oursland, M.	rem, cbi, cpl
Renaud, C.	cbi, ach, bkg
Richardson, W.	cbi, ach, ats
Shen, C.	gen, cpl, cbi
Swan, R.	alf, cbi, ccg
Talluto, M.	bio, cbi, ach
Vasquez, D.	cbi, lrg, ats
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Stromdahl, H.	phe, lth, ccg
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Summers, Kruger & Mant	ccg, knt, ped

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MacGowan, C.	alf, pbs, che
McFate, C.	ach, asm, che
Mitchell, R.	pbs, lrg, che
Morgan, P.	bfs, ach, che
O'Connor, E.	che, rem
Patron, F.	alf, kns, che
Qin, Y.	lab, kns, che
Sheppard, K.	alf, ccg, che
Thomas, P.	alf, che
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Kuehne, C.	ped, chs
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Miller, R.	ach, chs
Sharman, S.	lth, chs, bio
Williams, E.	gen, chs, tec
Wiltshire, M.	int, chs, lrg

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Hall, S.	sks, ach, chs
Hartlet & Greggs	car, chs, lsy
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Neathery, M.	ats, chs, sks
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Nat'l. Science Foundation	chs, car
Nat'l. Science Foundation	car, chs
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Bereiter et al.	cid, phe
Fouzder, N.	mce, cid
Durham, M.	cid, skt
Gilbert & Priest	cid, nfd
Hand, Treagust & Vance	cns, ats, cid
Jetton & Alexander	bft, bfs, cid
Kamen et al.	cid, lth
Kelly & Crawford	cid, phe, nas
Mastrilli, T.	ped, cid
Meyer & Woodruff	cid, inq
Mueller, A.	cid, cpl, lth
Roth et al.	cns, lth, cid
Roth et al.	ped, lrg, cid
Roth & Lucas	cid, phe, nas
Summerfield, J.	inq, cid
Watts, Barber & Alsop	ped, cid, skt
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Papers

Beeth & Hewson	ccg, ped, cid
Doig, B.	cid, ccg, ped
Groves, S.	cid, lrg
Mashhadi, A.	cid, rem, kns
Williams, J.	cid, lrg

Constructivism (cns)

Dissertations

Abbas, A.	cns, ped
Adams, A.	cns, ats, ccg
Al-Momani, I.	tpd, cns, att
Bednarski, M.	cns, asm, ped
Chien, C.	cbi, ach, cns

Craven, J. bft, bfs, cns
Creager, N. cns, int, ped
Dallal, K. ped, ats, cns
Freedman, R. bft, asm, cns
Hau, H. lth, ped, cns
Henriques, L. tpd, cns
Heron, L. cns, ats, ach
Lee, P. edt, pbs, cns
Lieu, S. nas, sts, cns
Osberg, K. cns, edt, ped
Parziale, J. cns, cid, kns
Troper, J. cns, cid, cpl
Walters, W. cns, ped
Yutakom, N. sts, cns, bft

Articles
Cannon, J. bkg, ped, cns
Finson et al. chs, cur, cpl
Hand, Treagust & Vance cns, ats, cid
Liu & Yager ref, sts, cns
Lord, T. cns, ped, lrg
Roth et al. cns, lth, cid
Shymansky et al. ccg, cns
Shymansky et al. cns, asm, tpd
Woodruff & Meyer cid, cns

Papers
Carr, K. cns, sks, pbs

Cooperative Learning; Group Work (cpl)

Dissertations
Beilby, J. cpl, ene, ped
Catallozzi, M. ped, lrg, cpl
Chung, M. edt, cpl, tpd
Gruner, H. phy, ped, cpl
Hoffman, B. cpl, cid, cbi
Hogan, K. cpl, kns, cid
Oursland, M. rem, cbi, cpl
Shen, C. gen, cpl, cbi
Troper, J. cns, cid, cpl
Werner, L. cbi, lrg, cpl

Articles
Finson et al. chs, cur, cpl
Mueller, A. cid, cpl, lth
Tiberghien & de Vries pbs, cpl, edt
Watters & Ginns knt, ped, cpl
Whittemore et al. sks, ped, cpl
Williams & Williams pbs, tec, cpl
Windschitl, M. cpl, ccg, kns

Papers
Springer, Stanne & Donovan cpl, ach, ats

Cross-Cultural Studies (cul)

Articles
Woolnough et al. cul, car, lsy
Zoller et al. cul, asm, ats

Papers
Beatty, A. (Ed.) cul, ref, cur
Mullis, I. cul, ach, ref
Nat'l. Alliance of Business ach, cul
Nat'l. Center for Educ. Statistics ach, cul
Nat'l. Center for Educ. Statistics ach, cul
Office of Educ'l. Research and Improvement ach, cul
Scottish Office Educ. and Industry Dept. ach, cul

Curriculum (cur)

Dissertations
Ahern, K. edt, cur, ene
Allan, E. cur, ped
Bennett, B. ene, cur
Blaine, L. int, ach, cur
Butler, S. pbs, lrg, cur
Crapenhoft-Gatewood int, ref, cur
DeChant, T. tpd, cur, ene
Deng, Z. cur, mat, phy
DeSpain, C. cur, lrg, hos
Dinucci, J. ref, knt, cur
Escalada, L. ped, cur, ats
Esterle, R. ref, cur, bkg
Golley, P. int, bft, cur
Gray, D. res, ach, cur
Finson et al. chs, cur, cpl
Hariharan, J. ats, cur, ped
Harlan, R. bkg, cur, bio
Hepburn, G. cur, ref
Jones, S. cur, tpd
Killebrew, C. cur, ats, lrg
Koul, R. cur, mat
Krusenklaus, H. asm, cur, bio
Lamb, M. chs, eqt, cur
Lavigne, S. sks, int, cur
Lawrence, L. int, cur, ach
Lee, C. bio, lab, cur
Marien, T. cur, sks, lrg
Mattson, S. bft, ntw, cur
McGaughey, J. ped, cur
Minner, D. ene, cur
Neiswonger, H. cur, bio, ped
O'Connor, T. ene, cur, ped
Pride, T. alf, phy, cur
Scheidemantel, D. cur, bio
Schramm, S. int, ref, cur
Schuen, D. ach, int, cur
Shea, J. int, cur, ref
Shin, A. ene, cur
Shin, D. tpd, ene, cur
Tejkl, P. cur, int
Wilhelms-Hackman, D. cur, sts, ref
Windward, R. cur, bfs, bft
Yang, F. tec, int, cur

Articles
Adedayo & Olawepo int, ene, cur
Aldridge et al. ref, cur, inq
Elam et al. cur, res, ped
Finson et al. chs, cur, cpl
Howe & Stubbs ntw, tpd, cur
Kassebaum et al. cur, asm
Kirst et al. cur, phe, ref
Koul & Dana cur, mat
Mazzoni et al. cur, ped, bio
Pace, P. ene, cur, his
Rowell, Gustafson & Guilbert pbs, cur, tec
Swann & Brown cur, bft
Tunnicliffe, S. ats, bio, cur
Woods, D. pbs, tec, cur

Papers
American Assoc. for the Advancement of Science ref, cur
Beatty, A. (Ed.) cul, ref, cur
Blank & Langesen ach, cur, ped
Burrill & Kennedy ref, ped, cur
Chaplin, D. sks, car, cur
Ediger, M. cur, ref, bfs
Ediger, M. phe, ref, cur
Howard Hughes Medical Inst. cur, car, ntw
Kirst & Bird ref, cur, bkg
Lokan, Ford & Greenwood ach, cur
Mashhadi & Han phe, cur
McNeely, M. (Ed.) et al. cur, asm
Nat'l. Research Council ref, cur, asm
Nat'l. Science Foundation ref, ped, cur
Raizen, S. ref, asm, cur
Webb, N. ref, asm, cur
Webb, N. ref, asm, cur

Educational Technology (edt)

Dissertations

Adrian, B.	edt, ped, lth
Ahern, K.	edt, cur, ene
Allen, D.	edt, ach, ats
Chung, M.	edt, cpl, tpd
Clark, S.	cbi, edt, ats
Doby, J.	tpd, edt, knt
Dundis, S.	edt, lrg, ach
Fife, B.	kns, edt
Gordin, D.	rem, edt, inq
Hsi, S.	edt, ntw, cid
Kizito, R.	edt, att
Lee, P.	edt, pbs, cns
Love, C.	int, lit, edt
Myhre, O.	ped, edt, tpd
Omami, C.	ped, edt, lrg
Osberg, K.	cns, edt, ped
Palacio-Cayetano, J.	pbs, edt
Parker, T.	ene, edt
Robinson, R.	edt, esg, ped
Runge, A.	edt, ats, phy
Young, J.	ped, cbi, edt

Articles

Albaugh et al.	edt, sks
Beeth & Wagler	edt, inq, ntw
Clifford et al.	lrg, edt
Harwood & McMahon	edt, ats, ach
Jackson, D.	edt, lrg
Jackson et al.	edt, ped
Lavoie, D.	edt, tpd
Nelson & Pan	edt, lrg
Tiberghien & de Vries	pbs, cpl, edt
Tinker, R.	ntw, edt
Trumper, R.	edt, lab, sks
Wilcox & Jensen	edt, lit, gen
Woolsey & Bellamy	edt, ped

Papers

Baker & Turturice	edt, ped, bio
Harris, J. (Ed.)	edt, pbs
Wallace & Kupperman	sks, edt, kns

Environmental Education (ene)

Dissertations

Ahern, K.	edt, cur, ene
Alao, S.	kns, ene, ats
Beilby, J.	cpl, ene, ped
Bennett, B.	ene, cur
De Laney, T.	gen, ene, ats
DeChant, T.	tpd, cur, ene
Gardner, W.	fsd, ene, ped
Harding, J.	lrg, ats, ene
Hays, I.	phe, ene
Hoffmann, J.	ene, lit
Hsu, S.	ene, tpd
Langmaid, K.	bfs, ene
Lemburg, R.	ene, fsd
Marco, P.	att, ene, mat
May, T.	ene, att, bft
McBeth, W.	ene, asm, kns
Miller, J.	bfs, ene, bkg
Minner, D.	ene, cur
Nevala, A.	ene, asm
O'Connor, T.	ene, cur, ped
Page, S.	ene, fsd, ats
Parker, T.	ene, edt
Rasmussen, B.	ene, nfd, his
Schanhals, E.	lrg, ped, ene
Shin, A.	ene, cur
Shin, D.	tpd, ene, cur
Spachuk, L.	ene, tpd
Surbrook, N.	ene, ats, fsd

Articles

Adedayo & Olawepo	int, ene, cur
Kyburz-Graber et al.	ene, pbs, ped
Pace, P.	ene, cur, his

Papers

Hollweg, K.	ene, hos, asm
Wagner, E.	ats, ene, res

Equity (eqt)

Dissertations

Donald, C.	chs, eqt, ped
Hitt, K.	gen, eqt, tpd
Jones, L.	gen, eqt
Lamb, M.	chs, eqt, cur
Muire, W.	ach, eqt, ref

Articles

Armstrong, C.	bkg, eqt, phe
Burkham et al.	gen, eqt, ped
Campbell & Sanders	tpd, gen, eqt
Jones, L.	eth, eqt, sks
McFarland, J.	asm, chs, eqt
Wang & Staver	gen, ach, eqt

Papers

Bae, Y.	gen, eqt, ach
Rodriguez, A.	ach, eqt

Earth & Space Science; Geology (esg)

Dissertations

Lopez, E.	esg, eth
Robinson, R.	edt, esg, ped

Papers

Alaska Challenger Learning Center	tec, esg, ats
Rediscovering Geography Committee, NRC	esg, sts, res

Ethnicity (eth)

Dissertations

Griffin, G.	pbs, eth, bkg
Hill, G. P.	eth, tec, ach
Lewis, B.	eth, car, lth
Lopez, E.	esg, eth
Minear, N.	car, eth, gen
Oluka, S.	nas, eth, phe
Stansbury, S.	eth, lsy, bkg
Sweeney, A.	mce, cid, eth
Walters, N.	eth, car

Articles

Fleer, M.	eth, alf, kns
Fouad, Smith & Enochs	asm, car, eth
Granados & Callanan	eth, bkg, sks
Jones, L.	eth, eqt, sks
Klein et al.	eth, gen, sks
Loving & Marshall	tpd, eth
Parsons, E.	eth, gen, nas

Evolution (evo)

Dissertations

Park, H.	evo, his
Preston, G.	evo, mat

Articles

Marques & Thompson	alf, evo

Field Studies; Outdoor Education (fsd)

Dissertations

Bradford, C.	tpd, fsd, ped
Freund, J.	mce, fsd, ats
Gardner, W.	fsd, ene, ped
Lavender, L.	fsd, his
Lee, S.	fsd, ach, lab
Lemburg, R.	ene, fsd
Nodurft, S.	fsd, ats

Page, S.	ene, fsd, ats
Surbrook, N.	ene, ats, fsd

Articles

Orion et al.	fsd, asm
Wood, Cass & Potter	fsd, hos, sks

Gender (gen)

Dissertations

Armstrong-Hall, J.	gen, sks, pbs
Barrett, M.	gen, bkg, car
Blue, J.	gen, lrg, bkg
Brown, E.	ach, ped, gen
Conefrey, T.	cid, gen, car
De Laney, T.	gen, ene, ats
DeClue, T.	gen, tec, bkg
Ferreira, M.	gen, car
Filippelli, L.	gen, car, ats
Gable, D.	gen, car, ats
Hamilton, L.	asm, gen, ach
Hitt, K.	gen, eqt, tpd
Hyde, M.	car, gen, ntw
Jacek, L.	gen, lrg, cbi
Jones, L.	gen, eqt
Kochheiser, K.	gen, lrg
Manhart, J.	lit, gen
Michel-Clark, I.	gen, mat
Minear, N.	car, eth, gen
Nyhof-Young, J.	tpd, gen, res
Parsons, B.	ats, sts, gen
Pearce, R.	lsy, gen, ach
Robeck, E.	phe, mce, gen
Shauman, K.	gen, bkg, car
Shen, C.	gen, cpl, cbi
Tingley, P.	ach, ats, gen
Tonso, K.	gen, tec
Volz, N.	gen, ats, ach
Williams, E.	gen, chs, tec
Williams, T.	nfd, ats, gen

Articles

Brownlow & Durham	gen, nas, nfd
Burkham et al.	gen, eqt, ped
Campbell & Sanders	tpd, gen, eqt
Chinn & Iding	bfs, bkg, gen
Erinosho, S.	gen, ats, bkg
Erinosho, S.	gen, car, bkg
Greenfield, T.	gen, nas, ats
Klein et al.	eth, gen, sks
Lord & Holland	chs, sks, gen
Norby, R.	car, ntw, gen
Parsons, E.	eth, gen, nas
Wang & Staver	gen, ach, eqt
Wilcox & Jensen	edt, lit, gen

Papers

Bae, Y.	gen, eqt, ach

History; Historical Implications (his)

Dissertations

Bunt, N.	his, ntw, ref
Lavender, L.	fsd, his
Park, H.	evo, his
Rasmussen, B.	ene, nfd, his
Tucker, L.	his
Yamamoto, K.	his, ref, mat

Articles

Linn, M.	lab, his
Pace, P.	ene, cur, his
Sheehan, R.	his, mat
Song et al.	ccg, his, phe

Papers

Erduran, S.	his, che

Hands-On Science (hos)

Dissertations

Cole, K.	mce, hos, ats
DeSpain, C.	cur, lrg, hos
Everage, H.	tpd, hos, asm
Lipman, D.	tpd, nas, hos
Sartin, K.	int, hos

Articles

Freedman, M.	hos, ats, ach
Johnson, Wardlow & Franklin	hos, lrg
McDonald, R.	hos, nfd, tpd
Polzella, L.	chs, hos, ats
Wood, Cass & Potter	fsd, hos, sks

Papers

Denoya, L. (Ed.) et al.	nfd, hos, sts
Hollweg, K.	ene, hos, asm

Inquiry (inq)

Dissertations

Beck, D.	inq, lth
Brandes, A.	inq, lth, nas
Enger, S.	bkg, ped, inq
Gordin, D.	rem, edt, inq
Kraus, P.	inq, ped
Louden, C.	ped, ach, inq
Orcutt, J.	inq, ats, ach
Polman, J.	inq, ref, ped
Priestly, W.	lab, inq, tpd
Wallace, S.	inq, ach, ats
Yonts, J.	inq, lab, ats

Articles

Aldridge et al.	ref, cur, inq
Allen, S.	inq, lrg, nfd
Beeth & Wagler	edt, inq, ntw
Crandall, G.	lab, inq
Meyer & Woodruff	cid, inq
Shepardson, D.	inq, lab, lrg
Summerfield, J.	inq, cid

Papers

Jarrett, D.	ref, inq, ped
Murphy & Coppola	ntw, res, inq
Nat'l. Science Foundation	inq, ref
Whitin & Whitin	inq, ped

Integration; Interdisciplinary (int)

Dissertations

Blaine, L.	int, ach, cur
Crapenhoft-Gatewood, K.	int, ref, cur
Creager, N.	cns, int, ped
Dieck, P.	int, ats, mat
Foster, J.	ach, ped, int
Gavin, A.	int, ach
Golley, P.	int, bft, cur
Gonzalez, M.	mce, int
Huntley, M.	int
Lavigne, S.	sks, int, cur
Lawrence, L.	int, cur, ach
Love, C.	int, lit, edt
Sartin, K.	int, hos
Schramm, S.	int, ref, cur
Schuen, D.	ach, int, cur
Shea, J.	int, cur, ref
Tejkl, P.	cur, int
Wiltshire, M.	int, chs, lrg
Yang, F.	tec, int, cur

Articles

Adedayo & Olawepo	int, ene, cur
Harris et al.	pbs, int, ped
Morrow et al.	int, ach, ats
Ursyn, A.	int, rem, lrg

Papers

Harris, J. (Ed.)	int, sts, mat
Lee, P.	int, lit, sks

Student Knowledge (kns)

Dissertations

Alao, S.	kns, ene, ats
Blank, L.	ped, ccg, kns

Chin, C.	lrg, kns
Chinn, C.	lrg, kns, mat
Draper, F.	lrg, kns
Engelhardt, P.	alf, phy, kns
Fife, B.	kns, edt
Gillespie, K.	ats, kns, nfd
Giuliano, F.	pbs, kns, ped
Hogan, K.	cpl, kns, cid
Huong, T.	kns, phy, ats
Krylova, I.	alf, che, kns
MacDonald, A.	kns, lrg
McBeth, W.	ene, asm, kns
Nicdao-Quita, M.	kns
Parziale, J.	cns, cid, kns
Patron, F.	alf, kns, che
Qin, Y.	lab, kns, che
Sandomir, M.	kns, lth, ccg

Articles

Boyes & Stanisstreet	kns, rem, sts
Fleer, M.	eth, alf, kns
Guruswamy et al.	phy, kns
Hatzinikita & Koulaidis	kns, alf, phy
Hayhurst, Campbell & Howlett	kns, phy
Park & Pak	kns, phy
Ploetzner & Van Lehn	cbi, pbs, kns
Tamir, P.	alf, kns, res
Watts, Gould & Alsop	kns, skt
Windschitl, M.	cpl, ccg, kns

Papers

Mashhadi, A.	cid, rem, kns
Nat'l. Assessment Governing Bd.	ach, kns
Schau et al.	kns, asm
Wallace & Kupperman	sks, edt, kns

Teacher Knowledge (knt)

Dissertations

Almazroa, H.	nas, bft, knt
Bryan, L.	tpd, bft, knt
D'Agincourt, L.	tpd, knt, att
Dinucci, J.	ref, knt, cur
Doby, J.	tpd, edt, knt
Loh-Yeo, W.	skt, mat, knt
Veal, W.	ped, tpd, knt

Articles

Abd-El-Khalick & BouJaoude	knt, nas
Adams & Krockover	tpd, knt, bft
Atwood & Atwood	alf, knt, ccg
Haidar, A.	alf, knt, che
Hynd et al.	ccg, tpd, knt
Powell, R.	cht, knt, ped
Preece, P.	alf, knt, phy
Smith, R.	knt, tpd
So, W.	knt, lrg, skt
Watters & Ginns	knt, ped, cpl

Papers

Kennedy, M.	knt, ped, res
Summers, Kruger & Mant	ccg, knt, ped

Laboratory (lab)

Dissertations

Doster, E.	ats, bfs, lab
Keefer, R.	bfs, lab, lrg
Krieger, C.	lab, lrg, cbi
Kujawinski, D.	sks, asm, lab
Lee, C.	bio, lab, cur
Lee, S.	fsd, ach, lab
Priestly, W.	lab, inq, tpd
Qin, Y.	lab, kns, che
Wang, M.	lab, che
Yonts, J.	inq, lab, ats

Articles

Crandall, G.	lab, inq
Fisher et al.	lab, bfs, ach
Howard & Boone	lab, ats, ped
Linn, M.	lab, his
Parkinson & Adendorff	lab, mat, lit
Shepardson, D.	inq, lab, lrg
Trumper, R.	edt, lab, sks
Wilkinson & Ward	lab, bfs, bft

Papers

Cournaya, Hernandez & Valenzia	pbs, lab, sks

Science Literacy (lit)

Dissertations

Carter, N.	nfd, lit, rem
Hoffmann, J.	ene, lit
Love, C.	int, lit, edt
Manhart, J.	lit, gen
Thurmond, C.	bft, lit
Wilder, M.	bft, lit, ref

Articles

Anderson et al.	lit, res
Korpan et al.	lit, mat, res
Parkinson & Adendorff	lab, mat, lit
Schmidt, H.	alf, che, lit
Wilcox & Jensen	edt, lit, gen
Wright, L.	bfs, nas, lit

Papers

Bybee, R.	lit, ref, phe
Lee, P.	int, lit, sks

Learning; Comprehension (lrg)

Dissertations

Blue, J.	gen, lrg, bkg
Butler, S.	pbs, lrg, cur
Catallozzi, M.	ped, lrg, cpl
Chin, C.	lrg, kns
Chinn, C.	lrg, kns, mat
DeSpain, C.	cur, lrg, hos
Draper, F.	lrg, kns
Dundis, S.	edt, lrg, ach
Farrell, E.	nfd, lrg
Glenn, J.	che, ach, lrg
Hanley, C.	ped, lrg, lth
Harding, J.	lrg, ats, ene
Harp, S.	lth, lrg
Jacek, L.	gen, lrg, cbi
Johnson, L.	sks, lrg
Keefer, R.	bfs, lab, lrg
Killebrew, C.	cur, ats, lrg
Kim, N.	cbi, bio, lrg
Kochheiser, K.	gen, lrg
Krieger, C.	lab, lrg, cbi
MacDonald, A.	kns, lrg
Marien, T.	cur, sks, lrg
Maslin, L.	ach, lrg
Mitchell, R.	pbs, lrg, che
Morgan, M.	sks, lrg, ped
Omami, C.	ped, edt, lrg
Rusbult, C.	nas, ped, lrg
Schanhals, E.	lrg, ped, ene
Vasquez, D.	cbi, lrg, ats
Werner, L.	cbi, lrg, cpl
Wiltshire, M.	int, chs, lrg
Wizinowich, J.	ped, lrg

Articles

Allen, S.	inq, lrg, nfd
Anderson & Lee	lrg, chs
Chen & Donin	lrg, mce, mat
Clifford et al.	lrg, edt
Einsiedler & Treinies	ped, lrg
Falk, J.	lrg, nfd
Fisher, M.	nfd, lrg, ped
Griffin & Symington	nfd, lrg, ped
Iding, M.	mat, lrg
Jackson, D.	edt, lrg
Johnson, Wardlow & Franklin	hos, lrg
Johnstone et al.	pbs, sks, lrg
Korpan et al.	nfd, sts, lrg
Lord, T.	cns, ped, lrg

Nelson & Pan edt, lrg
Ramey-Gassert, L. nfd, lrg
Raun et al. ped, lrg
Roth et al. ped, lrg, cid
Sandifer, C. nfd, lrg
Shepardson, D. inq, lab, lrg
Sing & Chee cbi, tec, lrg
Slater, T. asm, lrg, ats
So, W. knt, lrg, skt
Ursyn, A. int, rem, lrg
Whittington et al. cid, lrg

Papers
Falk & Drayton ntw, lrg, tpd
Groves, S. cid, lrg
Lowery, L. lrg, ped, ref
Williams, J. cid, lrg

Learning Style, Cognitive Style (lsy)

Dissertations
Hein, T. lsy, sks, phy
Lynch, M. lsy, ped, sks
Myers, R. lsy, cbi
Pearce, R. lsy, gen, ach
Stansbury, S. eth, lsy, bkg
Wiseman, K. lsy, lth, ats

Articles
Hartlet & Greggs car, chs, lsy
Woolnough et al. cul, car, lsy

Learning Theory (lth)

Dissertations
Adrian, B. edt, ped, lth
Armstrong, K. bio, lth, bfs
Beck, D. inq, lth
Brandes, A. inq, lth, nas
Campbell, B. lth, pbs
Hanley, C. ped, lrg, lth
Harp, S. lth, lrg
Hau, H. lth, ped, cns
Lewis, B. eth, car, lth
Sandomir, M. kns, lth, ccg
Senneca, F. nas, lth, tpd
Sharman, S. lth, chs, bio
Stromdahl, H. phe, lth, ccg
Wiseman, K. lsy, lth, ats

Articles
Alsop & Watts nfd, ccg, lth
Cobern, W. lth, ats
Kamen et al. cid, lth
Mueller, A. cid, cpl, lth

Roth et al. cns, lth, cid
Stow, W. lth, sks

Papers
Marek & Cavallo lth, ped, ref

Materials; Equipment (mat)

Dissertations
Chinn, C. lrg, kns, mat
Deng, Z. cur, mat, phy
Dieck, P. int, ats, mat
Koul, R. cur, mat
Lawlor-Lopez, E. att, tpd, mat
Loh-Yeo, W. skt, mat, knt
Marco, P. att, ene, mat
Michel-Clark, I. gen, mat
Ojala, J. mat
Pensak, K. ref, tpd, mat
Preston, G. evo, mat
Yamamoto, K. his, ref, mat

Articles
Chavkin, L. mat
Chen & Donin lrg, mce, mat
Ginsberg, E. att, mat, ped
Gossen & Kaczor mat
Guzzetti et al. ccg, mat
Haiqi, Z. mat, bio, res
Iding, M. mat, lrg
Korpan et al. lit, mat, res
Koul & Dana cur, mat
Lynch, S. asm, mat, ref
Parkinson & Adendorff lab, mat, lit
Shanahan & McComas bkg, sts, mat
Sheehan, R. his, mat

Papers
Eisenhower Nat'l. Clearinghouse nfd, tpd, mat
Harris, J. (Ed.) tpd, mat
Harris, J. (Ed.) int, sts, mat

Multicultural Education; Bilingual Education (mce)

Dissertations
Cole, K. mce, hos, ats
Freund, J. mce, fsd, ats
Gonzalez, M. mce, int
Robeck, E. phe, mce, gen
Sweeney, A. mce, cid, eth

Articles
Chen & Donin lrg, mce, mat
Fisher & Waldrip mce, bkg, asm

Fouzder, N. mce, cid
Shaw, J. mce, asm, sks

Nature of Science; Philosophy of Science (nas)

Dissertations
Almazroa, H. nas, bft, knt
Brandes, A. inq, lth, nas
Drori, G. nas, phe
George, R. ats, nas
Hemler, D. tpd, nas, res
Hsueh, T. bft, nas
Jelinek, D. bfs, ats, nas
Lieu, S. nas, sts, cns
Lipman, D. tpd, nas, hos
Oluka, S. nas, eth, phe
Rusbult, C. nas, ped, lrg
Senneca, F. nas, lth, tpd

Articles
Abd-El-Khalick & BouJaoude knt, nas
Alters, B. nas, phe
Barman, C. bfs, nas
Brownlow & Durham gen, nas, nfd
Gascoigne & Metcalfe ntw, nas, tec
Greenfield, T. gen, nas, ats
Kelly & Crawford cid, phe, nas
Mellado, V. nas, ped, bft
Meyling, H. phe, ccg, nas
Palmquist & Finley bft, nas, ccg
Parsons, E. eth, gen, nas
Penner et al. rem, sks, nas
Roth & Lucas cid, phe, nas
Wright, L. bfs, nas, lit

Nonformal & Informal Education (nfd)

Dissertations
Carter, N. nfd, lit, rem
Farrell, E. nfd, lrg
Gillespie, K. ats, kns, nfd
Havasy, R. nfd, ach, ats
Hurd, D. nfd, tpd
Kosten, L. bkg, nfd, ats
Munroe, E. nfd, asm
Pearson, R. asm, nfd
Rasmussen, B. ene, nfd, his
Williams, T. nfd, ats, gen
Wu, H. nfd, asm

Articles
Allen, S. inq, lrg, nfd
Alsop & Watts nfd, ccg, lth

Brownlow & Durham	gen, nas, nfd
Falk, J.	lrg, nfd
Fisher, M.	nfd, lrg, ped
Gilbert & Priest	cid, nfd
Griffin & Symington	nfd, lrg, ped
Korpan et al.	nfd, sts, lrg
McDonald, R.	hos, nfd, tpd
Ramey-Gassert, L.	nfd, lrg
Sandifer, C.	nfd, lrg
Schauble & Bartlett	nfd, res
Stevens & Hall	nfd, tec

Papers

Denoya, L. (Ed.) et al.	nfd, hos, sts
Eisenhower Nat'l. Clearinghouse	nfd, tpd, mat
Ponzio & Peterson	ntw, nfd, ped

Networks; Collaboration; Partnerships (ntw)

Dissertations

Abrams, R.	ntw, bft, tpd
Bunt, N.	his, ntw, ref
Hsi, S.	edt, ntw, cid
Hyde, M.	car, gen, ntw
Keating, T.	ntw, tpd
Kesselheim, C.	tpd, ntw
Mattson, S.	bft, ntw, cur
Owens, K.	sks, pbs, ntw
Parker, D.	tpd, ntw
White, M.	ntw, att, ats

Articles

Beeth & Wagler	edt, inq, ntw
Briscoe & Peters	ntw, tpd
Bruce et al.	ntw, ats, att
Carriere & Abouaf	ntw, res, ats
Dickinson et al.	att, ntw, tpd
Gascoigne & Metcalfe	ntw, nas, tec
Hounshell & Madrazo	ntw, bft, ref
Howe & Stubbs	ntw, tpd, cur
James et al.	car, ntw
Norby, R.	car, ntw, gen
Pole et al.	ats, car, ntw
Thoresen, C.	ntw, tpd, tec
Tinker, R.	ntw, edt

Papers

Cohen, K. (Ed.)	tec, ntw, ref
Falk & Drayton	ntw, lrg, tpd
Howard Hughes Medical Inst.	cur, car, ntw
Murphy & Coppola	ntw, res, inq
Nous, A.	rem, tec, ntw
Ponzio & Peterson	ntw, nfd, ped
UNC Math. and Sci. Educ. Network	ntw, tpd
UNC Math. and Sci. Educ. Network	ntw, ref
Yore, L.	tpd, ntw

Problem-Solving; Science Reasoning (pbs)

Dissertations

Armstrong-Hall, J.	gen, sks, pbs
Bowers, R.	pbs, sks
Butler, S.	pbs, lrg, cur
Campbell, B.	lth, pbs
Giuliano, F.	pbs, kns, ped
Griffin, G.	pbs, eth, bkg
Hsu, Y.	cbi, pbs
Lee, P.	edt, pbs, cns
MacGowan, C.	alf, pbs, che
Mitchell, R.	pbs, lrg, che
Owens, K.	sks, pbs, ntw
Palacio-Cayetano, J.	pbs, edt

Articles

Harris et al.	pbs, int, ped
Huffman, D.	pbs, ccg, phy
Johnstone et al.	pbs, sks, lrg
Kyburz-Graber et al.	ene, pbs, ped
Ploetzner & Van Lehn	cbi, pbs, kns
Rowell, Gustafson & Guilbert	pbs, cur, tec
Tiberghien & de Vries	pbs, cpl, edt
Toh et al.	pbs, sks
Williams & Williams	pbs, tec, cpl
Woods, D.	pbs, tec, cur

Papers

Carr, K.	cns, sks, pbs
Cournaya, Hernandez & Valenzia	pbs, lab, sks
Harris, J. (Ed.)	edt, pbs

Pedagogy (ped)

Dissertations

Abbas, A.	cns, ped
Adrian, B.	edt, ped, lth
Allan, E.	cur, ped
Anderson, C.	ped, ats
Bednarski, M.	cns, asm, ped
Beilby, J.	cpl, ene, ped
Blank, L.	ped, ccg, kns
Boedecker, M.	tpd, ref, ped
Bradford, C.	tpd, fsd, ped
Brown, E.	ach, ped, gen
Brownstein, E.	asm, ped
Catallozzi, M.	ped, lrg, cpl
Chung, P.	ats, che, ped
Creager, N.	cns, int, ped
Curtis, K.	ped, ats
Dallal, K.	ped, ats, cns
Dass, P.	tpd, ref, ped
Donald, C.	chs, eqt, ped
Enger, S.	bkg, ped, inq
Escalada, L.	ped, cur, ats
Foster, J.	ach, ped, int
Gardner, W.	fsd, ene, ped
Giuliano, F.	pbs, kns, ped
Gruner, H.	phy, ped, cpl
Hanley, C.	ped, lrg, lth
Hariharan, J.	ats, cur, ped
Hau, H.	lth, ped, cns
Hazari, A.	tpd, ped
Keller, B.	ped, ach, ats
Kowitz, A.	ped, skt
Kraus, P.	inq, ped
Kuehne, C.	ped, chs
Logan, L.	ped
Louden, C.	ped, ach, inq
Lynch, M.	lsy, ped, sks
McGaughey, J.	ped, cur
Meyer, K.	bft, ped
Morgan, M.	sks, lrg, ped
Mueller, J.	bft, ped, ref
Myhre, O.	ped, edt, tpd
Neiswonger, H.	cur, bio, ped
O'Connor, T.	ene, cur, ped
Omami, C.	ped, edt, lrg
Osberg, K.	cns, edt, ped
Polman, J.	inq, ref, ped
Robinson, R.	edt, esg, ped
Rusbult, C.	nas, ped, lrg
Schanhals, E.	lrg, ped, ene
Sutherland, E.	ped, phy, ccg
Tonnis, D.	asm, bft, ped
Varrella, G.	bft, ped
Veal, W.	ped, tpd, knt
Walters, W.	cns, ped
Wizinowich, J.	ped, lrg
Young, J.	ped, cbi, edt

Articles

Austin, C.	res, ped
Burkham et al.	gen, eqt, ped
Cannon, J.	bkg, ped, cns
Einsiedler & Treinies	ped, lrg
Elam et al.	cur, res, ped
Fisher, M.	nfd, lrg, ped
Ginsberg, E.	att, mat, ped
Griffin & Symington	nfd, lrg, ped
Harris et al.	pbs, int, ped
Howard & Boone	lab, ats, ped

Jackson et al. edt, ped
Krakauer, J. res, ped
Kyburz-Graber et al. ene, pbs, ped
Lord, T. cns, ped, lrg
Mastrilli, T. ped, cid
Mazzoni et al. cur, ped, bio
Mellado, V. nas, ped, bft
Powell, R. cht, knt, ped
Raun et al. ped, lrg
Roth et al. ped, lrg, cid
Rye & Dana sts, bft, ped
Saddler, D. ped, skt
Sitman et al. ped, ats, att
Smith et al. alf, ped, ccg
Trumper, R. ccg, ped
Van Lanen & Lockie ped, ats, ach
Watters & Ginns knt, ped, cpl
Watts, Barber & Alsop ped, cid, skt
Weiss, I. ref, ped, bft
Whittemore et al. sks, ped, cpl
Woolsey & Bellamy edt, ped
Zuckerman, J. ped, tpd

Papers
Baker & Turturice edt, ped, bio
Beeth & Hewson ccg, ped, cid
Blank & Langesen ach, cur, ped
Burrill & Kennedy ref, ped, cur
Committee on UG Sci. Educ., NRC ped, tpd
Doig, B. cid, ccg, ped
Jarrett, D. ref, inq, ped
Kennedy, M. knt, ped, res
Lowery, L. lrg, ped, ref
Marek & Cavallo lth, ped, ref
Nat'l. Science Foundation ref, ped, cur
Nat'l. Science Teachers Assoc. ped, tpd
Ponzio & Peterson ntw, nfd, ped
Stepanek, J. ref, ped
Summers, Kruger & Mant ccg, knt, ped
Weiss, I. ref, ped
Whitin & Whitin inq, ped

Philosophy; Epistemology (phe)

Dissertations
Drori, G. nas, phe
Hays, I. phe, ene
Howes, E. bfs, ref, phe
Oluka, S. nas, eth, phe
Robeck, E. phe, mce, gen
Stromdahl, H. phe, lth, ccg

Articles
Alters, B. nas, phe
Armstrong, C. bkg, eqt, phe
Bereiter et al. cid, phe
Dana et al. phe, tpd, ref
Kelly & Crawford cid, phe, nas
Kirst et al. cur, phe, ref
Medin et al. car, phe
Meyling, H. phe, ccg, nas
Roth & Lucas cid, phe, nas
Song et al. ccg, his, phe

Papers
Bybee, R. lit, ref, phe
Ediger, M. phe, ref, cur
Mashhadi & Han phe, cur
Mashhadi & Woolnough alf, phe, phy

Physics (phy)

Dissertations
Cundiff, K. ach, cbi, phy
Deng, Z. cur, mat, phy
Engelhardt, P. alf, phy, kns
Goebbel, B. phy, sts
Griffin, L. phy, alf, cht
Gruner, H. phy, ped, cpl
Hein, T. lsy, sks, phy
Huong, T. kns, phy, ats
Kudukey, J. tpd, phy
Lawrence, M. asm, sks, phy
Pride, T. alf, phy, cur
Runge, A. edt, ats, phy
Sutherland, E. ped, phy, ccg

Articles
Barak et al. phy, tpd
Guruswamy et al. phy, kns
Hatzinikita & Koulaidis kns, alf, phy
Hayhurst, Campbell & Howlett kns, phy
Huffman, D. pbs, ccg, phy
Park & Pak kns, phy
Preece, P. alf, knt, phy
Wubbels & Brekelmans bfs, bft, phy

Papers
Mashhadi & Woolnough alf, phe, phy

Reform; Educational Change; Standards (ref)

Dissertations
Boedecker, M. tpd, ref, ped
Bunt, N. his, ntw, ref
Century, J. ref
Crapenhoft-Gatewood int, ref, cur
Dass, P. tpd, ref, ped
Dinucci, J. ref, knt, cur
Esterle, R. ref, cur, bkg
Goldsmith, D. tpd, skt, ref
Hepburn, G. cur, ref
Howes, E. bfs, ref, phe
Mueller, J. bft, ped, ref
Muire, W. ach, eqt, ref
Pensak, K. ref, tpd, mat
Polman, J. inq, ref, ped
Rymer, J. res, bfs, ref
Schramm, S. int, ref, cur
Shea, J. int, cur, ref
Wilder, M. bft, lit, ref
Wilhelms-Hackman, D. cur, sts, ref
Yamamoto, K. his, ref, mat

Articles
Aldridge et al. ref, cur, inq
Anderson, R. res, tpd, ref
Dana et al. phe, tpd, ref
Hounshell & Madrazo ntw, bft, ref
Ingvarson & Loughran tpd, ref
Kirst et al. cur, phe, ref
Kumar, D. att, ref
Liu & Yager ref, sts, cns
Lynch, S. asm, mat, ref
Weiss, I. ref, ped, bft

Papers
American Assoc. for the Advancement of Science ref, cur
Beatty, A. (Ed.) cul, ref, cur
Burrill & Kennedy ref, ped, cur
Bybee, R. lit, ref, phe
Ctr. for Sci., Math. and Engineering Educ., NRC tpd, ref, res
Cohen, K. (Ed.) tec, ntw, ref
Council of Chief State School Officers ref
Directorate for Educ. and Human Resources tpd, ref
Ediger, M. cur, ref, bfs
Ediger, M. phe, ref, cur
Jarrett, D. ref, inq, ped
Kirst & Bird ref, cur, bkg
Knapp, M. res, ref
Lowery, L. lrg, ped, ref
Marek & Cavallo lth, ped, ref
Miller-Whitehead, M. ach, ref
Mullis, I. cul, ach, ref
Nat'l. Educ. Goals Panel ach, ref, tpd
Nat'l. Educ. Goals Panel ref, ach
Nat'l. Research Council ref, cur, asm
Nat'l. Research Council ref, tpd

Nat'l. Science Foundation	inq, ref
Nat'l. Science Foundation	ref, ped, cur
Project Kaleidoscope	ref
Raizen, S.	ref, asm, cur
Stepanek, J.	ref, ped
Stepanek & Jarrett	ref, asm
Texley & Wild	ref, tpd
UNC Math. and Sci. Educ. Network	ntw, ref
Webb, N.	ref, asm, cur
Webb, N.	ref, asm, cur
Weiss, I.	ref, ped

Representation; Modeling (rem)

Dissertations

Carter, N.	nfd, lit, rem
Gordin, D.	rem, edt, inq
O'Connor, E.	che, rem
Oursland, M.	rem, cbi, cpl

Articles

Boyes & Stanisstreet	kns, rem, sts
dos Santos et al.	cbi, rem
Flannery, M.	rem, res, bio
Penner et al.	rem, sks, nas
Ursyn, A.	int, rem, lrg

Papers

Mashhadi, A.	cid, rem, kns
Nous, A.	rem, tec, ntw

Research; Reviews of Research; Conference Proceedings (res)

Dissertations

Gray, D.	res, ach, cur
Hemler, D.	tpd, nas, res
Nyhof-Young, J.	tpd, gen, res
Rymer, J.	res, bfs, ref
Schirripa, S.	sks, res

Articles

Anderson, R.	res, tpd, ref
Anderson et al.	lit, res
Austin, C.	res, ped
Carriere & Abouaf	ntw, res, ats
Elam et al.	cur, res, ped
Flannery, M.	rem, res, bio
Flannery, M.	res, bio
Haiqi, Z.	mat, bio, res
Hamilton et al.	res, ach
Kahn & Scott	car, ats, res
Korpan et al.	lit, mat, res
Krakauer, J.	res, ped
Niaz, M.	res
Nichols, Tippins & Wieseman	tpd, res, skt
Schauble & Bartlett	nfd, res
Stratford, S.	cbi, res
Tamir, P.	alf, kns, res

Papers

Beatty, A. (Ed.)	ach, res
Bennof, R.	res, car
Ctr. for Sci., Math. and Engineering Educ., NRC	tpd, ref, res
Kennedy, M.	knt, ped, res
Knapp, M.	res, ref
Murphy & Coppola	ntw, res, inq
Rediscovering Geography Committee, NRC	esg, sts, res
Rubba, P. (Ed.) et al.	res
Wagner, E.	ats, ene, res

Student Skills (sks)

Dissertations

Armstrong-Hall, J.	gen, sks, pbs
Bowers, R.	pbs, sks
Crismond, D.	tec, sks
Hein, T.	lsy, sks, phy
Hirst, S.	sks, ach
Johnson, L.	sks, lrg
Kujawinski, D.	sks, asm, lab
Lavigne, S.	sks, int, cur
Lawrence, M.	asm, sks, phy
Lynch, M.	lsy, ped, sks
Marien, T.	cur, sks, lrg
Morgan, M.	sks, lrg, ped
Noyes, D.	ach, sks
Owens, K.	sks, pbs, ntw
Schirripa, S.	sks, res
Waker, R.	cbi, sks

Articles

Albaugh et al.	edt, sks
Billington, H.	asm, sks
Granados & Callanan	eth, bkg, sks
Hall, S.	sks, ach, chs
Johnstone et al.	pbs, sks, lrg
Jones, L.	eth, eqt, sks
Klein et al.	eth, gen, sks
Lord & Holland	chs, sks, gen
McKenna, B.	sks, tec
Neathery, M.	ats, chs, sks
Penner et al.	rem, sks, nas
Shaw, J.	mce, asm, sks
Stow, W.	lth, sks
Toh et al.	pbs, sks
Trumper, R.	edt, lab, sks
Whittemore et al.	sks, ped, cpl
Wood, Cass & Potter	fsd, hos, sks
Zoller & Tsaparlis	asm, sks

Papers

Carr, K.	cns, sks, pbs
Chaplin, D.	sks, car, cur
Cournaya, Hernandez & Valenzia	pbs, lab, sks
Lee, P.	int, lit, sks
Lesgold, Feuer & Black (Eds.)	sks, car, asm
Wallace & Kupperman	sks, edt, kns

Teacher Skills (skt)

Dissertations

Goldsmith, D.	tpd, skt, ref
Hildreth, D.	att, bft, skt
Kowitz, A.	ped, skt
Loh-Yeo, W.	skt, mat, knt

Articles

Durham, M.	cid, skt
Saddler, D.	ped, skt
So, W.	knt, lrg, skt
Spear, M.	asm, skt
Nichols, Tippins & Wieseman	tpd, res, skt
Watts, Barber & Alsop	ped, cid, skt
Watts, Gould & Alsop	kns, skt

Science, Technology, Society (sts)

Dissertations

Goebbel, B.	phy, sts
Lieu, S.	nas, sts, cns
Ngongbo, L.	sts, att, tpd
Parsons, B.	ats, sts, gen
Wilhelms-Hackman, D.	cur, sts, ref
Yutakom, N.	sts, cns, bft

Articles

Boyes & Stanisstreet	kns, rem, sts
Caseau & Norman	sts, ats, att
Korpan et al.	nfd, sts, lrg
Liu & Yager	ref, sts, cns
Robinson et al.	bfs, bft, sts
Rye & Dana	sts, bft, ped
Scharmann et al.	sts, tpd, att
Shanahan & McComas	bkg, sts, mat

Papers

Denoya, L. (Ed.) et al.	nfd, hos, sts
Harris, J. (Ed.)	int, sts, mat
Rediscovering Geography Committee, NRC	esg, sts, res

Technology (tec)

Dissertations

Crismond, D.	tec, sks
DeClue, T.	gen, tec, bkg
Dube, A.	ats, car, tec
Hill, G. P.	eth, tec, ach
Luckett, P.	tec, ats
McCauley, E.	att, bft, tec
Tonso, K.	gen, tec
Williams, E.	gen, chs, tec
Yang, F.	tec, int, cur

Articles

Gascoigne & Metcalfe	ntw, nas, tec
McKenna, B.	sks, tec
Rowell, Gustafson & Guilbert	pbs, cur, tec
Sing & Chee	cbi, tec, lrg
Stevens & Hall	nfd, tec
Thoresen, C.	ntw, tpd, tec
Williams & Williams	pbs, tec, cpl
Woods, D.	pbs, tec, cur

Papers

Alaska Challenger Learning Center	tec, esg, ats
Cohen, K. (Ed.)	tec, ntw, ref
Nous, A.	rem, tec, ntw

Teacher Professional Development (tpd)

Dissertations

Abrams, R.	ntw, bft, tpd
Al-Momani, I.	tpd, cns, att
Aldrich, L.	att, tpd
Anderson, R.	res, tpd, ref
Boedecker, M.	tpd, ref, ped
Bradford, C.	tpd, fsd, ped
Broadway, F.	tpd, cid
Bryan, L.	tpd, bft, knt
Cho, H.	att, bft, tpd
Chung, M.	edt, cpl, tpd
D'Agincourt, L.	tpd, knt, att
Dass, P.	tpd, ref, ped
DeChant, T.	tpd, cur, ene
Doby, J.	tpd, edt, knt
Everage, H.	tpd, hos, asm
Goldsmith, D.	tpd, skt, ref
Hazari, A.	tpd, ped
Hemler, D.	tpd, nas, res
Henriques, L.	tpd, cns
Hitt, K.	gen, eqt, tpd
Horton, N.	tpd, att
Hsu, S.	ene, tpd
Hurd, D.	nfd, tpd
Jobe, R.	tpd
Jones, S.	cur, tpd
Keating, T.	ntw, tpd
Kesselheim, C.	tpd, ntw
Kudukey, J.	tpd, phy
Lawlor-Lopez, E.	att, tpd, mat
Lipman, D.	tpd, nas, hos
Myhre, O.	ped, edt, tpd
Ngongbo, L.	sts, att, tpd
Nyhof-Young, J.	tpd, gen, res
Parker, D.	tpd, ntw
Pensak, K.	ref, tpd, mat
Priestly, W.	lab, inq, tpd
Ridgway, C.	tpd, bft
Senneca, F.	nas, lth, tpd
Sentif, M.	tpd, bft
Shin, D.	tpd, ene, cur
Spachuk, L.	ene, tpd
Spiegel, S.	tpd
Veal, W.	ped, tpd, knt
Wood, B.	tpd, asm

Articles

Adams & Krockover	att, bft, tpd
Adams & Krockover	tpd, knt, bft
Barak et al.	phy, tpd
Briscoe & Peters	ntw, tpd
Campbell & Sanders	tpd, gen, eqt
Dana et al.	phe, tpd, ref
Dickinson et al.	att, ntw, tpd
Howe & Stubbs	ntw, tpd, cur
Huinker & Madison	bft, tpd
Hynd et al.	ccg, tpd, knt
Ingvarson & Loughran	tpd, ref
Lavoie, D.	edt, tpd
Loving & Marshall	tpd, eth
McDonald, R.	hos, nfd, tpd
Nichols, Tippins & Wieseman	tpd, res, skt
Parker, J.	tpd, att
Scharmann et al.	sts, tpd, att
Shymansky et al.	cns, asm, tpd
Smith, R.	knt, tpd
Thoresen, C.	ntw, tpd, tec
Yerrick et al.	bft, ccg, tpd
Zuckerman, J.	att, tpd
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Papers

Ctr. for Sci., Math. and Engineering Educ., NRC	tpd, ref, res
Committee on UG Sci. Educ., NRC	ped, tpd
Crow, T. (Ed.) et al.	asm, tpd
Directorate for Educ. and Human Resources	tpd, ref
Eisenhower Nat'l. Clearinghouse	nfd, tpd, mat
Falk & Drayton	ntw, lrg, tpd
Harris, J. (Ed.)	tpd, mat
Nat'l. Educ. Goals Panel	ach, ref, tpd
Nat'l. Research Council	ref, tpd
Nat'l. Science Teachers Assoc.	ped, tpd
Texley & Wild	ref, tpd
Tobias, S.	tpd
UNC Math. and Sci. Educ. Network	ntw, tpd
Yore, L.	tpd, ntw